

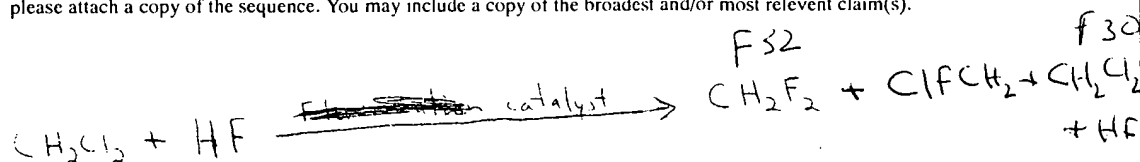
Paula Sheppard

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L4 10 SEA FILE=REGISTRY ABB=ON PLU=ON FH/MF
L5 24252 SEA FILE=HCAPLUS ABB=ON PLU=ON L1 OR ?DICHORO?(5A)?MET
HANE? OR ?DICHLOROMETHANE?
L7 5936 SEA FILE=HCAPLUS ABB=ON PLU=ON L3 OR ?DIFLUORO?(5A)?MET
HANE? OR ?DIFLUOROMETHANE?
L9 42093 SEA FILE=HCAPLUS ABB=ON PLU=ON L4 OR ?HYDROFLURO? OR
HYDRO?(A)?FLURO?
L11 40 SEA FILE=HCAPLUS ABB=ON PLU=ON L5(L)L9(L)L7

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L11 ANSWER 1 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1998:183906 HCAPLUS

DN 128:206163

TI Process and catalysts for the continuous preparation of
difluoromethane by the fluorination of
dichloromethane with **hydrogen fluoride**

SO Eur. Pat. Appl., 5 pp.

CODEN: EPXXDW

IN Wilmet, Vincent; Janssens, Francine

PI EP 829462 A1 980318

AI EP 97-202745 970904

PY 1998

AB **Difluoromethane** is prepd. in a continuous process by the fluorination of **dichloromethane** with **hydrogen fluoride** in a liq. reaction mixt. contg. org. and inorg. (e.g., the catalyst SnCl₄) fractions. The org. fraction in the liq. medium is .ltoreq.25% of the sum of wt. of the org. and inorg. fractions and the wt. of the **dichloromethane** in the liq. medium is .ltoreq.10% of the sum of the org. and inorg. fractions.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(process and catalysts for the continuous prepn. of
difluoromethane by the fluorination of
dichloromethane with **hydrogen fluoride**
)

IT 75-09-2, Dichloromethane, reactions

7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(process and catalysts for the continuous prepn. of
difluoromethane by the fluorination of
dichloromethane with **hydrogen fluoride**
)

L11 ANSWER 2 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1998:134442 HCAPLUS

DN 128:171431

TI Hydrolytic decomposition of dichlorodifluoromethane on modified zirconium oxide surfaces

SO Catal. Lett. (1998), Volume Date 1997, 49(3,4), 199-205

CODEN: CALEER; ISSN: 1011-372X

AU Hess, A.; Kemnitz, E.

PY 1998

AB The hydrolytic decompn. of dichlorodifluoromethane (CFC-12) on various modified Zr oxide surfaces was studied. The reaction was carried out under flow conditions at 500.degree.. Complete CFC-12 conversion and long-time stability of the catalysts were achieved accompanied by a limitation of the undesired CFC-13 formation. The max. CFC-12 conversion was obsd. on catalysts of sulfated zirconia or zirconia obtained from temp.-controlled calcination of Zr oxide hydrate. The reaction depends on the presence or in situ formation of Bronsted acid sites. FTIR-photoacoustic measurements were performed on pyridine complexes chemisorbed on the catalyst surface in order to analyze the changes in the catalyst acidity. The effects of the temp. and water in the reaction gas on the catalyzed compn. of CFC-12 are examd.

L11 ANSWER 3 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1998:7029 HCAPLUS

DN 128:61200

TI Hydrodehalogenation of dichlorodifluoromethane (CFC-12) on supported metal catalysts

SO Arch. Ochr. Srodowiska (1997), 23(3-4), 47-57

CODEN: AOSRD6; ISSN: 0324-8461

AU Czajka, Bogdan; Kirszensztejn, Piotr; Wachowski, Leszek; Lopatka, Renata; Bell, Tom N.; Becalski, Adam

PY 1997

AB The reaction of CCl2F2 (CFC-12) with dihydrogen has been studied on a Me/.gamma.-Al3O3 catalysts (where Me = Ru, Fe or Ni) contg. 0.26, 0.52 and 1.56 mol% of an appropriate metal. The product (distribution) and the extent of conversion was shown to be highly dependent both on the kind and coverage of certain metals, and on the temp.

L11 ANSWER 4 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1997:798580 HCAPLUS

DN 128:16653

TI Vapor-Liquid Equilibria for the Systems Difluoromethane + Hydrogen Fluoride, Dichlorodifluoromethane + Hydrogen Fluoride, and Chlorine + Hydrogen Fluoride

SO J. Chem. Eng. Data (1998), 43(1), 13-16

CODEN: JCEAAX; ISSN: 0021-9568

AU Kang, Yun Whan

PY 1998

- AB Isothermal vapor-liq. equil. for **difluoromethane + hydrogen fluoride, dichlorodifluoromethane + hydrogen fluoride**, and chlorine + **hydrogen fluoride** have been measured. The exptl. data for the binary systems are correlated with the NRTL equation with the vapor-phase assocn. model for the mixts. contg. **hydrogen fluoride**, and the relevant parameters are presented. The binary system **difluoromethane + hydrogen fluoride** forms a homogeneous liq. phase, and the others form min. boiling heterogeneous azeotropes at the exptl. conditions.
- IT **75-10-5, Difluoromethane 7664-39-3, Hydrogen fluoride**, properties
RL: PRP (Properties)
(systems; vapor-liq. equil. for systems **difluoromethane + hydrogen fluoride, dichlorodifluoromethane + hydrogen fluoride**, and chlorine + **hydrogen fluoride**)
- L11 ANSWER 5 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:776136 HCAPLUS
DN 128:36364
TI Azeotropic distillation process for separating difluoromethane from dichlorofluoromethane
SO PCT Int. Appl., 14 pp.
CODEN: PIXXD2
IN Cerri, Gustavo; Kong, Kin Ching; Swain, Charles Frances; Basu, Rajat Subhra
PI WO 9744301 A1 971127
AI WO 97-US8674 970522
PY 1997
AB Dichlorodifluoromethane is sepd. from difluoromethane by making use of the azeotrope formed by these 2 compds. and removing the difluoromethane as a distn. bottoms product.
- IT **7664-39-3, Hydrogen fluoride**, reactions
RL: RCT (Reactant)
(azeotropic distn. process for sepg. **dichlorodifluoromethane** from **difluoromethane**)
- L11 ANSWER 6 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:732129 HCAPLUS
DN 127:347906
TI Fluorination process for the preparation of **difluoromethane** from **dichloromethane** and **hydrogen fluoride**
f SO Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
IN Garrait, Dominique; Guiraud, Emmanuel
PI EP 805136 A1 971105
AI EP 97-400754 970402
PY 1997
AB **Difluoromethane** is prepd. by the fluorination of **dichloromethane** and **hydrogen fluoride** in the presence of chlorine and a fluorination catalyst. The reaction mixt. is distd. to produce a head product, contg. HCl and **difluoromethane**, and a bottoms product, contg. 90% of the nonreacted **dichloromethane, hydrogen fluoride**, and **chlorofluoromethane**, which bottoms product is recycled to the fluorination reactor. A process flow diagram is presented.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)
(fluorination process for the prepn. of **difluoromethane** from **dichloromethane** and **hydrogen fluoride**)

- IT 75-09-2, Dichloromethane, reactions
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(fluorination process for the prepn. of difluoromethane from dichloromethane and hydrogen fluoride)
- L11 ANSWER 7 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:281849 HCAPLUS
DN 126:263837
TI Vapor-phase process and catalysts for the production of difluoromethane from hydrogen fluoride and dichloromethane
SO PCT Int. Appl., 14 pp.
CODEN: PIXXD2
IN Clemmer, Paul Gene; Smith, Addison Miles; Tung, Hsueh Sung; Bass, John Stephen
PI WO 9711043 A1 970327
AI WO 96-US14734 960913
PY 1997
AB Difluoromethane (i.e., HFC-32; I) is prepd. in high yield and selectivity by: (A) preheating a mixt. of HF (II) and Cl₂CH₂ (III) to form a vaporized and superheater compn.; (B) reacting this superheated compn. in the presence of a fluorination catalyst (e.g., Cr₂O₃/Al₂O₃) to form a product stream contg. F₂CH₂, ClFCH₂ (IV), HCl (V), Cl₂CH₂, and HF; (C) distg. the product stream to produce a high-boiling stream comprising II, III, and IV, and a low-boiling stream comprising I, II, and V; and (D) recovering substantially pure I from the low-boiling distn. fraction.
- IT 75-10-5P, Difluoromethane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(vapor-phase process and catalysts for the prodn. of difluoromethane from hydrogen fluoride and dichloromethane)
- IT 75-09-2, Dichloromethane, reactions
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(vapor-phase process and catalysts for the prodn. of difluoromethane from hydrogen fluoride and dichloromethane)
- L11 ANSWER 8 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:145152 HCAPLUS
DN 126:143889
TI Catalytic gas-phase fluorination synthesis of difluoromethane from dichloromethane and hydrogen fluoride
SO Eur. Pat. Appl., 8 pp.
CODEN: EPXXDW
IN Requieme, Benoit; Lacroix, Eric; Lantz, Andre
PI EP 751107 A1 970102
AI EP 96-401150 960529
PY 1997
AB CH₂F₂ is prepd. by the reaction of CH₂Cl₂ (I) with anhyd. HF in the presence of 0.1-5 mol O₂ per 100 mol of I at 330-450.degree. in the presence of an optionally supported Cr catalyst.
- IT 75-10-5P, Difluoromethane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(catalytic gas-phase fluorination synthesis of difluoromethane from dichloromethane and hydrogen fluoride)
- IT 75-09-2, Dichloromethane, reactions
7664-39-3, Hydrofluoric acid, reactions
RL: RCT (Reactant)

(catalytic gas-phase fluorination synthesis of
**difluoromethane from dichloromethane and
hydrogen fluoride**)

- L11 ANSWER 9 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:140671 HCAPLUS
DN 126:136256
TI Isothermal Vapor-Liquid Equilibria for the Systems 1-Chloro-1,1-
difluoroethane + Hydrogen Fluoride, 1,1-
**Dichloro-1-fluoroethane + Hydrogen
Fluoride**, and **Chlorodifluoromethane +
Hydrogen Fluoride**
SO J. Chem. Eng. Data (1997), 42(2), 324-327
CODEN: JCEAAX; ISSN: 0021-9568
AU Kang, Yun Whan; Lee, Young Yong
PY 1997
AB Isothermal vapor-liq. equil. for the three binary systems
1-chloro-1,1-**difluoroethane + hydrogen
fluoride**, 1,1-**dichloro-1-fluoroethane +
hydrogen fluoride**, and
chlorodifluoromethane + hydrogen fluoride
were measured. The exptl. data for the binary systems are
correlated with the NRTL equation with the vapor-phase assocn. model
for the mixts. contg. **hydrogen fluoride**, and the
relevant parameters are presented. All of the systems form min.
boiling heterogeneous azeotropes.
- L11 ANSWER 10 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:124390 HCAPLUS
DN 126:131180
TI Gas-phase process for the manufacture of **difluoromethane**
from **dichloromethane** and **hydrogen
fluoride** in the presence of chlorine
SO Eur. Pat. Appl., 8 pp.
CODEN: EPXXDW
IN Requieme, Benoit; Perdrieux, Sylvain; Cheminal, Bernard; Lacroix,
Eric; Lantz, Andre
PI EP 751108 A1 970102
AI EP 96-401151 960529
PY 1997
AB CH2F2 is manufd. from CH2Cl2 by a catalytic gas-phase fluorination
using anhyd. HF in the presence of Cl2. AlF3 on a Cr-Ni support is
used as the fluorination catalyst and the presence of Cl2 in the
reaction mixt. serves to increase the catalyst's fluorination
lifetime.
IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)
(gas-phase process for the manuf. of **difluoromethane**
from **dichloromethane** and **hydrogen
fluoride** in the presence of chlorine)
IT **75-09-2, Dichloromethane**, reactions
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(gas-phase process for the manuf. of **difluoromethane**
from **dichloromethane** and **hydrogen
fluoride** in the presence of chlorine)
- L11 ANSWER 11 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:35573 HCAPLUS
DN 126:76464
TI Mechanistic study of the selective hydrogenolysis of CCl2F2 (CFC-12)
to CH2F2 (HCF-32) over palladium on activated carbon
SO Recl. Trav. Chim. Pays-Bas (1996), 115(11/12), 505-510
CODEN: RTCPA3; ISSN: 0165-0513
AU van de Sandt, Emile J. A. X.; Wiersma, Andre; Makkee, Michiel; van
Bekkum, Hermam; Moulijn, Jacob A.

PY 1996
AB The influence of temp. (400-560K), H₂/CCl₂F₂ ratio (2.2-20), and wt. hourly space velocity (0.3-1.0 g/g.h) on the hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C was investigated. The catalyst shows a remarkably high selectivity to CH₂F₂ (70-90 mol%) at all conversion levels in a broad range of process conditions. A mechanism is proposed in which the reaction proceeds mainly via parallel reaction pathways. The postulated mechanism is supported by thermodyn. data.

L11 ANSWER 12 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1996:616394 HCAPLUS

DN 125:247197

TI Process and catalysts for the preparation of **difluoromethane hydrogen fluoride** and **dichloromethane**

SO Eur. Pat. Appl., 5 pp.

CODEN: EPXXDW

IN Wilmet, Vincent; Janssens, Francine

PI EP 732314 A1 960918

AI EP 96-200591 960305

PY 1996

AB **Difluoromethane** is prepd. in high yield and purity by the reaction of **hydrogen fluoride** and **dichloromethane** in the presence of a metal halide catalyst (e.g., SnCl₄).

IT **75-10-5P, Difluoromethane**

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(process and catalysts for the prepn. of **difluoromethane hydrogen fluoride** and **dichloromethane**)

IT **75-09-2, Dichloromethane, reactions**

7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(process and catalysts for the prepn. of **difluoromethane hydrogen fluoride** and **dichloromethane**)

L11 ANSWER 13 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1996:611391 HCAPLUS

DN 125:279125

TI Process development for the selective hydrogenolysis of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-32)

SO Stud. Surf. Sci. Catal. (1996), 101(Pt. A, 11th International Congress on Catalysis--40th Anniversary, 1996, Pt. A), 369-378
CODEN: SSCTDM; ISSN: 0167-2991

AU Wiersma, A.; Van de Sandt, E. J. A. X.; Makkee, M.; Van Bekkum, H.; Moulijn, J. A.

PY 1996

AB Pd on activated carbon is an efficient and stable catalyst for hydrogenolysis of CCl₂F₂ to CH₂F₂. The performance and stability of the catalyst strongly depend on the H₂ to CCl₂F₂ feed ratio. At low feed ratios coke deposition causes deactivation, but at high ratios sintering of Pd causes deactivation. The reaction follows parallel pathways. An ideal process for the hydrogenolysis includes a multi-tube fixed bed reactor with hydrogen recycle in which a limited amt. of methane is allowed.

L11 ANSWER 14 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1996:483534 HCAPLUS

DN 125:118017

TI Supported palladium-platinum hydrogenation catalyst and its use in the manufacture of hydrofluorocarbons

SO PCT Int. Appl., 16 pp.

CODEN: PIXXD2

IN Scott, John David; Goodyear, Gary; McCarthy, John Charles

PI WO 9617683 A1 960613

AI WO 95-GB2837 951206
PY 1996
AB Title catalyst having improved activity and selectivity comprises Pd and Pt at 2:1 to 500:1 wt. ratio carried on a support such as carbon and is used in the prodn. of a **hydrofluorocarbon** such as **difluoromethane** (I) by contacting a (hydro) **halofluorocarbon** such as **chlorodifluoromethane** (II) or **dichlorodifluoromethane**, preferably in a vapor phase, with hydrogen at elevated temp. in the presence of the catalysts. Thus, mixed metal chlorides in HCl were supported on carbon (surface area 800 m²/g, particle size 1.0-1.2 mm, 10% Pd, 1.8% Pt) giving a Pt-promoted Pd catalyst which showed II conversion 99.9% and I selectivity 91.3% at 380.degree..

L11 ANSWER 15 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:431554 HCAPLUS
DN 125:86173
TI Method for production of difluoromethane
SO Russ.
From: Izobreteniya 1995, (36), 209.
CODEN: RUXXE7
IN Vinogradov, Dmitriy V.; Khomutov, Vladimir A.; Barabanov, Valerij G.
PI RU 2051140 C1 951227
AI RU 93-93028401 930525
PY 1995
AB CH₂F₂ is prepd. by fluorination of CH₂Cl₂ with HF at 70-150.degree., using a catalyst contg. 79-96 wt.% SbCl₅, and the remainder KF, KF.HF, NaF, NaF.HF, NH₄F, NH₄F.HF, and/or CsF.HF, at a catalyst concn. of 40-85 wt.% (esp. 54.75 wt.%) vs. the mixt. of catalyst and CH₂Cl₂.
IT **7664-39-3, Hydrogen fluoride, reactions**
RL: RCT (Reactant)
(manuf. of **difluoromethane** by fluorination of **dichloromethane**)

L11 ANSWER 16 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:256085 HCAPLUS
DN 124:288753
TI Process for producing difluoromethane
SO PCT Int. Appl., 16 pp.
CODEN: PIXXD2
IN Yamada, Yasufu; Shibnuma, Takashi; Tsuda, Takehide
PI WO 9601241 A1 960118
AI WO 95-JP1320 950703
PY 1996
AB This patent application describes a process for producing **difluoromethane** by the reaction of **dichloromethane** with **hydrogen fluoride** in the presence of a catalyst in a liq. phase economically and safely, wherein the reaction is conducted by using antimony pentafluoride or a mixt. thereof with antimony trifluoride as the catalyst at a temp. of 80-150.degree.C under a pressure of 8-80 kg/cm².

L11 ANSWER 17 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:214765 HCAPLUS
DN 124:260354
TI Method of converting dichlorodifluoromethane into chlorodifluoromethane and other chlorofluoromethanes
SO U.S.S.R.
From: Izobreteniya 1993, (24), 54.
CODEN: URXXAF
IN Barabanov, Valerij G.; Datsevich, Leonid B.; Ereemeeva, Elena L.; Kalinin, Andrej Yu.; Kramerova, Galina E.; Lyubimova, Marina V.; Nagrodskij, Mikhail I.; Orlov, Georgij D.; Ryleev, Gennadij I.
PI SU 1824386 A1 930630
AI SU 91-4939388 910527


PY 1993
AB CF2Cl2 is converted into CHF2Cl and other chlorofluoromethanes by reaction with H2 [resp. mol ratio 4:(1-20)] in the gas phase at 220-250.degree. and 20-40 atm, using a 0.05-1% Pt/C catalyst.

L11 ANSWER 18 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:201270 HCAPLUS
DN 124:342345
TI A study on the hydrodechlorination reaction of dichlorodifluoromethane over Pd/AlF3 catalyst
SO J. Mol. Catal. A: Chem. (1996), 106(1-2), 83-91
CODEN: JMCCF2; ISSN: 1381-1169
AU Ahn, Byoung Sung; Lee, Sang Cheol; Moon, Dong Ju; Lee, Byung Gwon
PY 1996
AB The hydrodechlorination reaction of dichlorodifluoromethane (CF2Cl2) has been studied under an atm. pressure at 130-210.degree. over Pd/AlF3 catalyst. The effects of various reaction conditions on the catalyst performance in terms of the reaction rate and product distributions were extensively investigated and the adsorption behaviors of H2, CF2Cl2, CHF2Cl, CH2F2 and CH3F on the catalyst surface are compared. In addn., the plausible reaction scheme has been proposed based on the exptl. observations. Under the assumption that the formation of two main products, CH2F2 and CH4, proceeds through the hydrogenation of intermediate species, CF2, the reaction rate consts. have been calcd. by fitting the exptl. data with the reaction rate expression.

IT **75-10-5P, Difluoromethane**
RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrodechlorination of dichlorodifluoromethane over Pd/AlF3 catalyst)

L11 ANSWER 19 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:194711 HCAPLUS
DN 124:231839
TI Process for producing difluoromethane
SO PCT Int. Appl., 15 pp.
CODEN: PIXXD2
IN Tsuda, Takehide; Yamada, Yasufu; Shibamura, Takashi
PI WO 9535271 A1 951228
AI WO 95-JP1122 950607
PY 1995
AB This patent application describes a process for producing **difluoromethane** by fluorinating **dichloromethane** with **hydrogen fluoride** in a liq. phase in the presence of a fluorination catalyst under such conditions that the reaction is conducted under an abs. pressure of 1-10 kg/cm2 at a temp. in the range of 50 to 150.degree.C and the selected reaction temp. is a temp. at which **hydrogen fluoride** is not liquefied under the above-specified pressure. The above conditions serve to attain an extremely high conversion of **dichloromethane** and **hydrogen fluoride** and to minimize the amts. of byproducts other than R30 by recycling unreacted starting materials, typically at most 0.1% based on **difluoromethane**. Furthermore, the corrosion of the reactor scarcely occurs in the reaction of a highly corrosive antimony chloride fluoride with **hydrogen fluoride**, as long as the above conditions are kept.

L11 ANSWER 20 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:191614 HCAPLUS
DN 124:342628
TI Method for the preparation of difluoromethane
SO U.S., 6 pp.
CODEN: USXXAM
IN Nam, Kyung H.; Na, Doo C.; Kim, Dae S.
PI US 5495057 A 960227



AI US 95-398965 950302

PY 1996

AB A method for the prepn. of CH₂F₂ is disclosed, wherein CH₂Cl₂ reacts with HF in the liq. phase, at 70.degree.-90.degree. and approx. 11-12 kg/cm²G, in the presence of SbCl₅ catalyst. It is important that the concn. of pentavalent Sb is maintained at a level of 85% or more, with the feed mole ratio of HF to CH₂Cl₂ ranging from about 2.0 to 2.3. Applicable to industrial scale, the method is operated in a batch or continuous system. In addn., it exhibits superior conversion and prodn. yield. In an example with a mol ratio SbCl₅/CH₂Cl₂ of 0.17/1 and HF/CH₂Cl₂ of 2.0/1, the conversion rates of CH₂Cl₂ and HF were 93.6% and 86.92% by wt., and the product contained 93.52% CH₂F₂ and 6.48% CH₂ClF.

IT 75-09-2, Methylene chloride, reactions

RL: RCT (Reactant)

(prepn. difluoromethane by fluorination of methylene chloride using hydrogen fluoride and antimony pentachloride catalyst)

L11 ANSWER 21 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1996:42622 HCAPLUS

DN 124:120721

TI Performance of a rectification column on the reactor in the liquid-phase synthesis of difluoromethane

SO Zh. Prikl. Khim. (S.-Peterburg) (1995), 68(8), 1395-7

CODEN: ZPKHAB; ISSN: 0044-4618

AU Vinogradov, D. V.; Barabanov, V. G.; Khomutov, V. A.

PY 1995

AB The NRTL correlation equil. parameters for binary systems are derived to calc. the performance of a distn. column installed in the reactor for a liq.-phase CH₂F₂ synthesis. Vapor-liq. equil. for CH₂F₂-HF and ClFCH₂-HF systems was studied exptl. at 10.degree.. The exptl. data were used to calc. the parameters of the column installed in the reactor.

L11 ANSWER 22 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:994879 HCAPLUS

DN 124:86351

TI Process for converting chlorodifluoromethane and dichlorodifluoromethane

SO PCT Int. Appl., 24 pp.

CODEN: PIXXD2

IN Manogue, William H.; Noelke, Charles J.; Swearingen, Steven H.

PI WO 9524369 A1 950914

AI WO 95-US1518 950216

PY 1995

AB A process is disclosed for the conversion of halogenated methanes of the formula: CClyH₂-yF₂ (wherein y is 1 or 2) to a mixt. of conversion products. The process involves reacting certain halogenated hydrocarbon feeds and hydrogen (wherein said halogenated methanes are at least one mole percent of the halogenated hydrocarbon feed) in a reaction vessel of alumina, silicon carbide or at least one metal selected from gold, chromium, aluminum, molybdenum, titanium, nickel, iron, cobalt, and their alloys at a temp. of from about 500.degree.C to 800.degree.C and a pressure from about 101 kPa to 7000 kPa to produce a mixt. of conversion products of said halogenated methanes which comprises at least 5 mol percent C₂H₂F₄, wherein the mole ratio of CH₂FCF₃ to CHF₂CHF₂ in said C₂H₂F₄ is at least about 1:9.

L11 ANSWER 23 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:713958 HCAPLUS

DN 123:86591

TI Hydrogen fluoride-fluorination process and trivalent chromium catalysts for the production of difluoromethane and azeotropes of dihalomethanes

- containing chlorine from **dichloromethane**
- SO PCT Int. Appl., 26 pp.
CODEN: PIXXD2
- IN Furmanek, Paul S.; Glasscock, David A.; Keane, Michael, Jr.; Mahler, Barry A.; Rao, Velliyur Nott Mallikarjuna
- PI WO 9512563 A1 950511
- AI WO 94-US12473 941031
- PY 1995
- AB Difluoromethane is prepd. by contacting a gaseous mixt. contg. CH₂Cl₂ and HF with a catalyst contg. a trivalent chromium compd. (e.g., CrCl₃, fluorided CrCl₃, etc.) supported on C (having an ash content of <0.5 %) at 180-375.degree.. The catalyst and temp. conditions of this process allow the concurrent reaction CC1₃CF₃ with HF to form CC1₂FCF₃. CH₂ClF and unreacted CH₂Cl₂, each of which may be recovered as an azeotrope with HF, may be recycled.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)
(**hydrogen fluoride**-fluorination process and trivalent chromium catalysts for the prodn. of **difluoromethane** and azeotropes of **dihalomethanes** contg. chlorine from **dichloromethane**)
- IT **75-09-2, Dichloromethane, reactions**
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(**hydrogen fluoride**-fluorination process and trivalent chromium catalysts for the prodn. of **difluoromethane** and azeotropes of **dihalomethanes** contg. chlorine from **dichloromethane**)
- L11 ANSWER 24 OF 40 HCAPLUS COPYRIGHT 1998 ACS
- AN 1995:667043 HCAPLUS
- DN 123:35762
- TI Effect of the Metal-Support Interaction on the Catalytic Properties of Palladium for the Conversion of Difluorodichloromethane with Hydrogen: Comparison of Oxides and Fluorides as Supports
- SO J. Phys. Chem. (1995), 99(28), 11159-66
CODEN: JPCHAX; ISSN: 0022-3654
- AU Coq, Bernard; Figueras, Francois; Hub, Serge; Tournigant, Didier
- PY 1995
- AB The reaction of CF₂Cl₂ with hydrogen has been studied between 433 and 523 K and atm. pressure, over Pd catalysts supported on graphite and oxides or fluorides of Al, Ti, and Zr. In CF₂Cl₂ hydrogenation, CH₂F₂ and CH₄ represented >95% of the products. The catalytic properties of fluoride supported catalysts did not undergo any change as a function of time. In contrast, Pd supported on oxides showed changes in selectivity during the first hours on stream. This was ascribed to the reaction of the oxide support with HF released during the reaction. Alumina and titania were nearly completely converted to the corresponding fluorides, but not zirconia. The selectivity to the desired product CH₂F₂ was 56% for Pd/graphite and reached 90% for Pd/ZrF₄. The kinetic study suggested that the selectivity was controlled by the bond strength between a carbene-like species CF₂ and the surface. The strength of this interaction is supposed to vary with electron availability at the Pd surface, and this hypothesis was then investigated by IR spectroscopy using the adsorption of CO on Pd/Al₂O₃ and Pd/AlF₃. The morphol. of the Pd particles was little affected by the support and that AlF₃-supported Pd becomes electron deficient, due to the strong Lewis acidity of the support. This effect is mainly a short-range effect which is better induced by supports made up of a mixt. of fluorides, oxyfluorides, and hydroxyfluorides, rather than pure fluorides. Catalytic properties similar to those of Pd/AlF₃ and ZrF₄ can be simulated with Pd/graphite samples promoted with small amts. of aluminum or zirconium.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)

(metal-support interaction in **difluorodichloromethane**
hydrogenation catalyzed by oxide or fluoride-supported
palladium)

L11 ANSWER 25 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:453483 HCAPLUS

DN 122:293893

TI Manufacture of difluoromethane from dichloromethane

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

IN Tanaka, Kunitada; Shibamura, Takashi

PI JP 07017882 A2 950120 Heisei

AI JP 93-191942 930705

PY 1995

AB CH₂F₂ (I) is manufd. by reaction of CH₂Cl₂ (II) with HF in liq. phase in the presence of SbCl_xF_y (x + y = 5; y = 1-3) catalysts and treating the resulted CH₂FCl (III) with catalysts in liq. or gas phases or treating with HF in the presence of catalysts in gas phases. Thus, II was treated with HF in the presence of SbCl₂F₃ (prepd. from SbCl₅ and HF) at 80.degree. under 10 kG pressure. I and HCl followed by HF were removed from the product, and the residual III was passed through Cr oxide at 150.degree. and 80 mL/min to give 35.6 mL/min I.

L11 ANSWER 26 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:275367 HCAPLUS

DN 122:105240

TI Manufacture of difluoromethane

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

IN Muramaki, Kazuo; Oono, Hiromoto; Nagayasu, Toshio

PI JP 06263658 A2 940920 Heisei

AI JP 93-50954 930311

PY 1994

AB Title compd. (I) is manufd. from dichloromethane and HF by introducing the reaction products of dichloromethane and HF to the first distn. column for sepn. of HCl from the top and a fraction mainly consisting of I, chlorofluoromethane, dichloromethane, and HF from the bottom, ~~introducing the bottom fraction to the second~~ distn. column for withdrawal of a fraction mainly consisting of I from the top, forwarding the fraction to a sep. purifn. step to recover I, mixing the bottom from the second distn. column with dichloroethylene (sic) and HF to adjust the ratio and amt. of the reactants and feeding them to the reactor.

IT 7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(fluorination of **dichloromethane** to
difluoromethane)

IT 75-09-2, Dichloromethane, reactions

RL: RCT (Reactant)

(fluorination with **hydrogen fluoride** to
difluoromethane)

L11 ANSWER 27 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:275366 HCAPLUS

DN 122:105239

TI Manufacture of difluoromethane

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

IN Muramaki, Kazuo; Oono, Hiromoto; Nagayasu, Toshio

PI JP 06263657 A2 940920 Heisei

AI JP 93-50953 930311

PY 1994

AB Title compd. (I) is manufd. from dichloromethane and HF by ~~introducing the reaction products of dichloromethane and HF to the~~ first distn. column for sepn. of a main fraction contg. I and HCl

and a bottom fraction contg. dichloromethane, chlorofluoromethane, and HF, introducing the main fraction to the second distn. column for removal of HCl from the top and withdrawal of a fraction mainly consisting of I from the bottom, forwarding the fraction from the bottom to a sep. purifn. step to recover I, and adding dichloromethane and HF to the bottom fraction from the first distn. column. to adjust the ratio and amt. of the reactants and feeding them to the reactor.

IT 7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(fluorination of **dichloromethane** to **difluoromethane**)

IT 75-09-2, Dichloromethane, reactions

RL: RCT (Reactant)

(fluorination with **hydrogen fluoride** to **difluoromethane**)

L11 ANSWER 28 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:490741 HCAPLUS

DN 121:90741

TI The origin and fate of volatile trace components in municipal solid waste landfills

SO Waste Manage. Res. (1994), 12(2), 129-39

CODEN: WMARD8; ISSN: 0734-242X

AU Deipser, Anna; Stegmann, Rainer

PY 1994

AB The content of readily volatile halogenated hydrocarbons

(chlorinated as well as chlorinated/**fluorinated**

hydrocarbons (VCCs/CFCs)) and the BTEX arom. substances

(C6H6, PhMe, ethylbenzene, and xylene) in municipal solid waste

(MSW) was detd. by 2 methods. The emission potential of these

substances via the gas and leachate phase was studied during the different biol. degrdn. phases in the landfill.

Trichlorofluoromethane (R11),

dichlorodifluoromethane (R12) and **dichloromethane**

(R30) were the dominating halogenated trace substances. In the acid phase, with some VCCs/CFCs the emittance may take place .ltoreq.30%

via the water phase. Hexane, C6H6, and PhMe could be detected in

all tests. PhMe often occurred in relatively high concns. in MSW.

It could be shown that R11 degraded into dichlorofluoromethane.

L11 ANSWER 29 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:298054 HCAPLUS

DN 120:298054

TI Preparation of hydrogen-containing fluoromethanes

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

IN Yoshitake, Masaru; Tatematsu, Shin; Morikawa, Shinsuke

PI JP 06001731 A2 940111 Heisei

AI JP 92-183134 920617

PY 1994

AB The title compds. are prepd. by H redn. of CCl2F2 in gas phases in presence of redn. catalysts and .gtoreq.1 compds. chosen from

H-contg. chlorofluorocarbons and H-contg. fluorocarbons. CCl2F2,

CHF2CH3, and H were passed through Pt/activated C at 250.degree.

with 60 s contact time to give CHClF2 and CH2F2 with 51% and 20%

selectivity, resp., at .apprx.80% conversion.

L11 ANSWER 30 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:167282 HCAPLUS

DN 120:167282

TI Method for removing hydrogen fluoride from halocarbon mixtures

SO PCT Int. Appl., 31 pp.

CODEN: PIXXD2

IN Tsuda, Takehide; Matsumoto, Takeo; Tanaka, Yoshinori; Komatsu,

Satoshi; Koyama, Satoshi

PI WO 9321140 A1 931028
AI WO 93-JP455 930409
PY 1993
AB The method comprises distg. the title mixt. to remove binary azeotropic mixts. composed of HF and R-30, HF and R-31, and HF and R-32 or sepg. the mixt. into an upper liq. rich in HF and a lower liq. poor in HF and distg. the resp. phase in a similar manner.

L11 ANSWER 31 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1993:427687 HCAPLUS
DN 119:27687
TI Process for production of difluoromethane
SO Braz. Pedido PI, 28 pp.
CODEN: BPXXDX
IN Moore, Geoffrey James; O'Kell, Jenny
PI BR 9201323 A 921201
AI BR 92-1323 920410
PY 1992
AB CH₂F₂ (I) is produced by catalytic hydrogenation of halodifluoromethanes XYCF₂ (X, Y = H, Cl, Br; .gtoreq.1 of X and Y .noteq. H) at elevated temp. For example, H and CHClF₂ were passed over 10% Pd/C at 217.degree. and the product gases were dild. with N and scrubbed to remove acids, giving I and CH₄ as sole products in ratio (gas chromatog.) 8.74:1.65. Numerous addnl. runs explored various catalysts (Pd, Pt, Ru, Rh, NiO, Ni, and Pd-Ni) at various temps., plus the substrate CCl₂F₂.

L11 ANSWER 32 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1993:59278 HCAPLUS
DN 118:59278
TI Production of difluoromethane
SO Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
IN Moore, Geoffrey James; O'Kell, Jenny
~~PI EP 508660 A1 921014~~
AI EP 92-302785 920330
PY 1992
AB A process for prepn. of title compd. (I) comprises hydrogenation of XYCF₂ (X,Y = H, Cl, Br and at least 1 of X and Y .noteq. H) at elevated temp. in the presence of a hydrogenation catalyst. Thus, hydrogenation of ClF₂CH (II) at 260.degree. in a tube reactor contg. 8.2% Pd on Norit RX3 extrudate active C catalyst gave 76.6% conversion (by vol.) of II with 74.3% selectivity for I.

L11 ANSWER 33 OF 40 HCAPLUS COPYRIGHT 1998 ACS
AN 1987:578651 HCAPLUS
DN 107:178651
TI Fluorinated derivatives of tetrachloromethane
SO Czech., 4 pp.
CODEN: CZXXA9
IN Vachta, Jaromir; Grunt, Miloslav; Roh, Zdenek; Mekota, Frantisek; Pacha, Jaroslav; Siler, Jaroslav; Krasl, Karel; Posta, Antonin; Barta, Milen
PI CS 237613 B1 870216
AI CS 83-1754 830315
PY 1987
AB Combining the traditional FeCl₃/C fluorination catalysts with Fe (I) and Cu (II) powders increases the HF conversion of the fluorination process while decreasing the formation of higher-fluorinated products. Passing a 2.1:1 mixt. of HF and CCl₄ at 295.degree./0.2 MPa over 1.9 L of C impregnated with 20-30% FeCl₂ and mixed with 40 g Fe and 10 g Cu gave, after 300 h, 94.5% HF conversion and the product contg. CCl₄ 0.4, FCCl₃ 4.3, F₂CCl₂ 94.2, and F₃CCl 1%, vs. 91.28, 1.4, 7, 90.1, and 1.5, resp., for a parallel fluorination conducted with a control catalyst not contg. I or II powder.

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L11 ANSWER 34 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1987:485686 HCAPLUS

DN 107:85686

TI Highly selective carbon-13 separation by carbon dioxide-laser-induced IRMPD of **dichlorodifluoromethane/hydrogen iodide** and **bromochlorodifluoromethane/hydrogen iodide** mixtures

SO Chem. Phys. Lett. (1987), 137(6), 590-5

CODEN: CHPLBC; ISSN: 0009-2614

AU Ma, Peihua; Sugita, Kyoko; Arai, Shigeyoshi

PY 1987

AB The CO₂ laser-induced IRMPD (IR multiphoton dissocn.) of CF₂Cl₂/HI and CF₂ClBr/HI mixts. produced ¹³C-enriched CF₂HCl. In CF₂Cl₂/HI mixts., the CF₂HCl underwent secondary IRMPD in the continuing pulse irradiation at the same wavenumber and fluence, yielding CF₂H₂ with a ¹³C content of 97%. Because of efficient decomposition at relatively low fluences, CF₂ClBr seems to be a promising starting molecule in 2-step ¹³C enrichment.

L11 ANSWER 35 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1985:176308 HCAPLUS

DN 102:176308

TI Competition between hydrogen fluoride and hydrogen chloride molecular elimination channels in the infrared multiple-photon decomposition of 1,2-dichloro-1,1-difluoroethane. (II)

SO Reza Kagaku Kenkyu (1984), 6, 60-3

CODEN: RKAKDK; ISSN: 0558-471X

AU Ishikawa, Yoichi; Arai, Shigeyoshi

PY 1984

AB Time-resolved IR emission study shows that the HF and HCl molecular elimination channels compete with each other in the IR multiphoton decomposition of 1,2-dichloro-1,1-difluoroethane. Theoretical calculations were carried out for the decomposition using a stochastic trajectory method. The calculated results described satisfactorily the observed fluence dependences of HF and HCl yields in the unimolecular decomposition of highly vibrationally excited parent molecules.

L11 ANSWER 36 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1981:592761 HCAPLUS

DN 95:192761

TI Measurements of the surface tension of four halogenated **hydrocarbons, trichlorofluoromethane, dichlorodifluoromethane, trichlorotrifluoroethane (C₂Cl₃F₃), and dichlorotetrafluoroethane (C₂Cl₂F₄)**

SO Int. J. Thermophys. (1981), 2(2), 163-76

CODEN: IJTHDY; ISSN: 0195-928X

AU Watanabe, K.; Okada, M.

PY 1981

AB A capillary rise method was used to determine the surface tension of four different kinds of halogenated hydrocarbons (CCl₃F, CCl₂F₂, C₂Cl₃F₃, C₂Cl₂F₄). The measurements were performed for coexisting liquid and saturated vapor with maximum uncertainty 0.12 mN · m⁻¹ at temperatures from 273 K up to near the critical point of the respective substances. Under the same experimental conditions, two sets of surface tension data were obtained with two different Pyrex glass capillaries having inner radii 0.1536 ± 0.0004 and 0.1724 ± 0.0005 mm, respectively; the two sets of data are in agreement within 0.1 mN · m⁻¹. The data are represented by van der Waals-type correlations with a standard deviation of 0.10 mN · m⁻¹ for CCl₃F, 0.04 mN · m⁻¹ for CCl₂F₂, 0.08 mN · m⁻¹ for C₂Cl₃F₃, and 0.07 mN · m⁻¹ for C₂Cl₂F₄, respectively.

L11 ANSWER 37 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1979:491150 HCAPLUS

DN 91:91150

TI Fluorination of chlorinated hydrocarbons

SO U.S., 4 pp.

CODEN: USXXAM

IN Fiske, Tom R.; Baugh, Daniel W., Jr.

PI US 4147733 790403


AI US 78-908310 780522

PY 1979

AB Fluorinated lower aliph. chlorinated hydrocarbon were prepd. in the vapor phase with HF in the presence of steam and a metal (particularly Al, Cr, or Ni) fluoride catalyst at 275-425.degree.. Thus, vaporized 38% aq. HF and CH₂Cl₂ (1.4:1 molar ratio) were passed through a catalyst bed of Cr-Al fluoride at 400.degree. with 8.8 s residence time to give 11% CH₂ClF, 47% CH₂F₂, and 24% MeCl with 30% CH₂Cl₂ conversion. CH₂:CHF and MeCHF₂ were similarly prepd. from CH₂:CHCl.

IT 75-10-5P

RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, by fluorination of **dichloromethane** with
hydrogen fluoride, catalyst for)



L11 ANSWER 38 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1975:3609 HCAPLUS

DN 82:3609

TI The kinetics of the reaction of atomic hydrogen with difluorodichloromethane

SO St. Rab. Khim. Kaz. Univ. (1973), No. 3, 631-6

From: Ref. Zh., Khim. 1974, Abstr. 9B901

AU Ksandopulo, G. I.; Mansurov, Z. A.

PY 1973

AB Unavailable

L11 ANSWER 39 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1972:103684 HCAPLUS

DN 76:103684

TI Synthesis and formulation of several epinephrine salts as a aerosol dosage form

SO J. Pharm. Sci. (1972), 61(2), 219-23

CODEN: JPMSAE

AU Sciarra, John J.; Patel, Jitendra M.; Kapoor, Amrit L.

PY 1972

AB Various salts of epinephrine (I) such as the maleate, malate, and fumarate were prepd. Following the synthesis of these salts, a study of the partition coeff. of these salts in high mol. wt. alcs. such as octyl and hexadecyl alc. and water was carried out, and the results were compared to the partition coeff. of I bitartrate in these same vehicles. The soly. of these new salts in CHCl₃, CCl₄, and **fluorinated hydrocarbons** was then detd. Several systems incorporating these new salts were prepd. and subjected to a preliminary stability study. The partition coeff. of I maleate detd. between octyl alc.-water and hexadecyl alc.-water was higher than the value for I bitartrate, malate, and fumarate. The soly. of I maleate and fumarate in 4 propellants (**dichlorodifluoromethane, dichlorotetrafluoroethane, monochlorodifluoroethane, and difluoroethane**) was slightly higher than the I bitartrate and malate. As expected, difluoroethane dissolved the highest amt. of I salts as compared to the other propellants studied. I maleate and bitartrate had greater stability than the I malate and fumarate on the basis of the preliminary stability study.

L11 ANSWER 40 OF 40 HCAPLUS COPYRIGHT 1998 ACS

AN 1970:525651 HCAPLUS

DN 73:125651

TI Pulsed-discharge-initiated chemical lasers. I. **Hydrogen fluoride** laser emission from **chlorodifluoromethane, dichlorofluoromethane, trifluoromethane, and dichlorodifluoromethane--hydrogen** systems

SO J. Chem. Phys. (1970), 53(8), 3383-4

CODEN: JCPSA6

AU Lin, Ming Chang; Green, William H.

PY 1970

AB HF laser emission from CHF₂Cl, CHFCl₂, CHF₃, and CF₂Cl₂-H₂ systems was obtained by using a transverse, multiple-arc discharge. Both P₂₁ and P₁₀ transitions lase. The addn. of He enhanced emission from all lines. Addn. of H₂ caused a redn. in P₁₀ transition intensities and an increase in P₂₁ transition intensities. A time delay between P₂₁ and P₁₀ emission suggests that a cascading mechanism is operative. The ready availability of the P₁₀ transitions of HF and narrow pulse widths should make ir fluorescence studies practical.

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TSCA INFORMATION NOW CURRENT THROUGH JUNE 29, 1998

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Stereochemical name changes have been adopted and appear in CN's beginning 6/29/98. See the online news message for details.

** Notice ** If you recently ran a CSS search involving an AK-carbon connection, please enter NEWS at an arrow prompt for a message containing important details.

=>

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=> s e1-e3

1 7664-39-3/BI
(7664-39-3/RN)

1 75-10-5/BI
(75-10-5/RN)

1 75-09-2/BI
(75-09-2/RN)

L12 3 (7664-39-3/BI OR 75-10-5/BI OR 75-09-2/BI)

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=> d ide can 112 1-3

L12 ANSWER 1 OF 3 REGISTRY COPYRIGHT 1998 ACS

RN 7664-39-3 REGISTRY

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN Alsurf 45

CN Anhydrous hydrofluoric acid
CN Antisal 2b
CN Fluorhydric acid
CN Fluoric acid
CN Fluorine hydride (FH)
CN Fluorine monohydride
CN Hydrofluoric acid gas
CN Hydrogen fluoride
CN Hydrogen fluoride (HF)
CN Hydrogen monofluoride
DR 32057-09-3
MF F H
CI COM
LC STN Files: AGRICOLA, ANABSTR, APILIT, APILIT2, APIPAT, APIPAT2,
BIOBUSINESS, BIOSIS, CA, CABA, CANCERLIT, CAPLUS, CASREACT, CEN,
CHEMCATS, CHEMINFORMRX, CHEMLIST, CBNB, CHEMSAFE, CIN, CJACS,
CSCHEM, CSNB, DETHERM*, DIPPR*, EMBASE, GMELIN*, HSDB*, IFICDB,
IFIPAT, IFIUDB, IPA, MEDLINE, MRCK*, MSDS-OHS, NIOSHTIC, PDLCOM*,
PIRA, PNI, PROMT, RTECS*, TOXLINE, TOXLIT, TRCTHERMO*, TULSA,
ULIDAT, USPATFULL, VTB
(*File contains numerically searchable property data)
Other Sources: DSL**, EINECS**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)

HF

23255 REFERENCES IN FILE CA (1967 TO DATE)
170 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
23287 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 129:117264
REFERENCE 2: 129:116778
REFERENCE 3: 129:116722
REFERENCE 4: 129:116721
REFERENCE 5: 129:116246
REFERENCE 6: 129:116157
REFERENCE 7: 129:116154
REFERENCE 8: 129:115039
REFERENCE 9: 129:115004
REFERENCE 10: 129:114939

L12 ANSWER 2 OF 3 REGISTRY COPYRIGHT 1998 ACS
RN 75-10-5 REGISTRY
CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN Difluoromethane
CN Ecolo Ace 32
CN FC 32
CN Freon 32
CN Genetron 32
CN HFC 32
CN Methylene difluoride
CN R 32
CN R 32 (refrigerant)
FS 3D CONCORD

MF C H2 F2
CI COM
LC STN Files: ANABSTR, BEILSTEIN*, BIOBUSINESS, BIOSIS, CA,
CANCERLIT, CAOLD, CAPLUS, CASREACT, CEN, CHEMCATS, CHEMINFORMRX,
CHEMLIST, CBNB, CIN, CJACS, CSCHEM, CSNB, DETHERM*, DIPPR*,
GMELIN*, HODOC*, IFICDB, IFIPAT, IFIUDB, MEDLINE, MSDS-OHS,
NIOSHTIC, PDLCOM*, PROMT, RTECS*, SPECINFO, TOXLINE, TOXLIT,
TRCTHERMO*, ULIDAT, USPATFULL, VTB
(*File contains numerically searchable property data)
Other Sources: EINECS**, NDSL**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)

F-CH₂-F

1643 REFERENCES IN FILE CA (1967 TO DATE)
5 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
1649 REFERENCES IN FILE CAPLUS (1967 TO DATE)
127 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 129:114146
REFERENCE 2: 129:113771
REFERENCE 3: 129:110676
REFERENCE 4: 129:110399
REFERENCE 5: 129:108794
REFERENCE 6: 129:100554
REFERENCE 7: 129:97107
REFERENCE 8: 129:97069
REFERENCE 9: 129:97068
REFERENCE 10: 129:97067

L12 ANSWER 3 OF 3 REGISTRY COPYRIGHT 1998 ACS
RN 75-09-2 REGISTRY
CN Methane, dichloro- (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:

CN Aerothene MM
CN Dichloromethane
CN F 30
CN F 30 (chlorocarbon)
CN Freon 30
CN HCC 30
CN Khladon 30
CN Metaclen
CN Methane dichloride
CN Methylene chloride
CN Methylene dichloride
CN Narkotil
CN R 30
CN R 30 (refrigerant)
CN Solaesthin
CN Soleana VDA
CN Solmethine
FS 3D CONCORD
MF C H2 Cl2
CI COM
LC STN Files: AGRICOLA, ANABSTR, APILIT, APILIT2, APIPAT, APIPAT2,

BEILSTEIN*, BIOBUSINESS, BIOSIS, CA, CABA, CANCERLIT, CAOLD,
CAPLUS, CASREACT, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CBNB,
CHEMSAFE, CIN, CJACS, CSCHEM, CSNB, DETHERM*, DDFU, DIPPR*, DRUGU,
EMBASE, GMELIN*, HODOC*, HSDB*, IFICDB, IFIPAT, IFIUDB, IPA,
MEDLINE, MRCK*, MSDS-OHS, NAPRALERT, NIOSHTIC, PDLCOM*, PIRA, PNI,
PROMT, RTECS*, SPECINFO, TOXLINE, TOXLIT, TRCTHERMO*, TULSA,
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REFERENCE 2: 129:115689

REFERENCE 3: 129:115589

REFERENCE 4: 129:114973

REFERENCE 5: 129:114733

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L1          30 SEA FILE=REGISTRY ABB=ON  PLU=ON  CH2CL2/MF
L3          11 SEA FILE=REGISTRY ABB=ON  PLU=ON  CH2F2/MF
L4          10 SEA FILE=REGISTRY ABB=ON  PLU=ON  FH/MF
L5          24252 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L1 OR ?DICHLORO?(5A)?MET
             HANE? OR ?DICHLOROMETHANE?
L6          66904 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L4 OR ?HYDROFLUORO? OR
             HYDRO?(2A)?FLUOR?
L7          5936 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3 OR ?DIFLUORO?(5A)?MET
             HANE? OR ?DIFLUOROMETHANE?
L8          212 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5 AND L6 AND L7
L9          42093 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L4 OR ?HYDROFLUORO? OR
             HYDRO?(A)?FLUOR?
L11         40 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5(L)L9(L)L7
L14         1325 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ?FLUORINATION?(L)CATALYS
             T?
L15         24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L14 AND L8) NOT L11

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L15 ANSWER 1 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1998:42358 HCAPLUS

DN 128:101814

TI **Fluorination of hydrohalomethanes using
hydrogen fluoride** in the presence of Lewis acid
catalysts.

SO PCT Int. Appl., 23 pp.
CODEN: PIXXD2

IN Thenappan, Alagappan; Smith, Addison Miles; McKown, Jeffrey Warren;
Bell, Robert Louis

PI WO 9749655 A1 971231

AI WO 97-US10966 970624

PY 1997

AB **Fluorination catalysts** comprising Mo(V) halides,
Nb(V) halides, Ta(V) halides, Sn(IV) halides, Ti(IV) halides, and
mixts., are claimed. Thus, CH₂Cl₂ was autoclaved under 300-400 psig
HF at 120.degree. for 5 h in the presence of NbCl₅/SnCl₄ to give
CH₂CF₂ with 99.7% selectivity and 98.8% conversion.

IT **75-10-5P**, HFC-32

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)

(**fluorination of hydrohalomethanes using
hydrogen fluoride** in the presence of Lewis acid
catalysts)

IT **75-09-2**, Dichloromethane, reactions

RL: RCT (Reactant)

(**fluorination of hydrohalomethanes using
hydrogen fluoride** in the presence of Lewis acid
catalysts)

L15 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1997:496566 HCAPLUS

DN 127:96813

TI Shaped heterogeneous **fluorination catalysts** and
manufacture of halogenated hydrocabons with high catalytic activity,
low pressure loss, and long **catalyst** life

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

IN Kanemura, Takashi; Kono, Satoshi; Kitano, Keisuke; Takahashi,

Kazuhiro; Shibamura, Shun
PI JP 09141105 A2 970603 Heisei
AI JP 95-329853 951124
PY 1997
AB The (un)supported title catalysts based mainly on Cr, Cr oxide, Cr fluoride, and/or Cr oxyfluoride are hollow cylindrical with outer diam. 2-20 mm, inner/outer diam. ratio 0.1-0.7, and length 0.2-2.0 times the outer diam. Cr hydroxide from Cr nitrate and ammonium hydroxide was mixed with 3% graphite, compression molded (outer diam. 5 mm, inner diam. 2 mm, length 5 mm) and treated with HF-N at 200-360.degree. for 2 h and used as catalyst for reaction of HCFC-133a with HF with HFC-134a yield 12.3%.

IT **75-10-5P, HFC-32**
RL: IMF (Industrial manufacture); PREP (Preparation)
(shaped heterogeneous **fluorination catalysts**
and manuf. of halogenated hydrocabons with high catalytic activity, low pressure loss, and long **catalyst** life)

IT **75-09-2, Dichloromethane, reactions**
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(shaped heterogeneous **fluorination catalysts**
and manuf. of halogenated hydrocabons with high catalytic activity, low pressure loss, and long **catalyst** life)

L15 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:370767 HCAPLUS
DN 127:54976
TI Catalytic **hydrolysis** of **dichlorodifluoromethane**
(CFC-12) on sol-gel-derived titania unmodified and modified with H2SO4
SO J. Catal. (1997), 168(2), 482-490
CODEN: JCTLA5; ISSN: 0021-9517
AU Fu, Xianzhi; Zeltner, A.; Yang, Qing; Anderson, Marc A.
PY 1997
AB Catalytic **hydrolysis** of **dichlorodifluoromethane**
(CFC-12) in a humid air stream was studied over pure and sulfate-promoted TiO2 **catalysts** which were prepd. by sol-gel methods. The results showed that complete conversion of CFC-12 on unmodified TiO2 was achieved at reaction temps. higher than 340.degree. under the reaction conditions employed. The selectivity to CO2 ([Co2]produced/[CFC-12]converted) varied from 0.5 to 0.88 over the range of 250-350.degree. and CClF3 (CFC-13) was detected as the main byproduct. Surface **fluorination** of the TiO2 **catalyst** during the reaction improved its activity, induced the formation of the fluorinated byproduct CFC-13, and changed such properties of the **catalyst** as its sp. surface area, pore size distribution, and crystal size. It was found that the catalytic and structural properties of TiO2 were greatly improved by sulfation. The sulfated TiO2 (TiO2/SO42-) exhibited excellent reaction activity and selectivity for CFC-12 catalytic decompn. at low reaction temps. (190-250.degree.) while retaining a stable structure. Complete decompn. of CFC-12 with stoichiometric prodn. of CO2 was obsd. over the TiO2/SO42- **catalyst** at 250.degree. under otherwise identical reaction conditions as used for pure TiO2. Results of **catalyst** characterization by x-ray diffraction (XRD), XPS, Fourier transform IR spectroscopy (FTIR), and N2 sorption anal. indicated that surface sulfate species formed on the sulfated TiO2. When compared to unmodified TiO2, the sulfated TiO2 exhibited higher resistance to crystal phase transformation from anatase to rutile, higher resistance to the deleterious effects of **fluorination** of the **catalyst**, and higher sp. surface area. **Fluorination** of the **catalyst** did not improve the activity of sulfated TiO2, and no CFC-13 was detected as a byproduct, indicating that fluorine was not involved in the formation of reaction sites over the sulfated TiO2 **catalysts**

- L15 ANSWER 4 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1997:370438 HCAPLUS
DN 127:8413
TI Heterogeneous catalyzed decomposition reactions of **dichlorodifluoromethane** in the presence of water on .gamma.-alumina
SO J. Fluorine Chem. (1997), Volume Date 1996-1997, 81(2), 197-204
CODEN: JFLCAR; ISSN: 0022-1139
AU Kemnitz, E.; Kohne, A.; Lieske, E.
PY 1997
AB The heterogeneous catalyzed decompn. of CCl₂F₂ (CFC-12) in the presence of water was studied, using .gamma.-alumina as **catalyst**. The catalyzed hydrolysis reaction yields very high conversion degrees of CFC-12 in the 1st reaction stage. For a period of .apprx.3 h there is a remarkable lack of balance between the amt. of liberated HF and HCl owing to the uptake of HF by the oxide solid forming .alpha.-AlF₃. Only after .apprx.3 h does the heterogeneous solid/gas reaction come to an end and then the HCl and the HF balance is equal. With the increasing fluoride content of the solid phase, the decompn. degree of CFC-12 seems to be higher but this is owing to the formation of CClF₃ (CFC-13), which is nearly stable under the conditions used. Mechanistic explanations are given for the formation of CClF₃ whether by dismutation reactions or owing to **hydrofluorination** reactions of CFC-12. Arguments are given about which mechanism might be the most probable. Mechanistic hypotheses are concluded and discussed with respect to the processes at the **catalyst** surface on the basis of the results.
- IT **7664-39-3, Hydrogen fluoride**, formation
(nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(heterogeneous catalyzed decompn. reactions of **dichlorodifluoromethane** in presence of water on .gamma.-alumina)
- L15 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:605506 HCAPLUS
DN 125:225078
TI Process for producing **difluoromethane** and **difluorochloromethane**
SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2
IN Tsuda, Takehide; Shibamura, Takashi
PI WO 9624570 A1 960815
AI WO 96-JP264 960208
PY 1996
AB The process comprises fluorinating **dichloromethane** and **trichloromethane** with HF in a liq. phase in the presence of a **fluorination catalyst** in a reactor at 1-20 kg/cm² and 50-150.degree.C, whereby **difluoromethane** and **difluorochloromethane** can be produced in the reactor simultaneously or alternately, safely and economically. Under the specified temp. and pressure, the HF exists mainly as a gas and imparts no corrosion to the reactor.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)
(fluorination process for producing **difluoromethane** and **difluorochloromethane**)
- IT **75-09-2, Dichloromethane**, reactions
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(**fluorination** process for producing **difluoromethane** and **difluorochloromethane**)

- L15 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1996:409749 HCAPLUS
DN 125:57895
TI **Dehydrofluorination, fluorination, and**
decomposition of fluorohydrocarbons with phosphate **catalysts**
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
IN Takita, Jusaku; Ishihara, Tatsuki; Nakajo, Tetsuo
PI JP 08104656 A2 960423 Heisei
AI JP 94-243024 941006
PY 1996
AB Phosphate salt **catalysts** are used in (A)
dehydrofluorination of F-contg. halohydrocarbons, (B) prepn.
of satd. fluorohydrocarbons from halohydrocarbons with HF, (C)
formation of satd. fluorohydrocarbons from F-contg. halohydrocarbons
contg. unsatd. halohydrocarbons and/or Cl- or Br-contg.
halohydrocarbons with HF, and (D) decompn. of F-contg.
halohydrocarbon with HF. CF₃Me/H/He were passed through 3 wt.%
Ag-contg. Mg₃(PO₄)₂ (prepn. given) at 450.degree. to give CF₂:CH₂
with 19.3% conversion and 73% selectivity.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); PREP (Preparation)
(**dehydrofluorination, fluorination, and**
decompn. of fluorohydrocarbons with phosphate **catalysts**
)
- IT **75-09-2, Methylene chloride, reactions 7664-39-3,**
Hydrofluoric acid, reactions
RL: RCT (Reactant)
(**dehydrofluorination, fluorination, and**
decompn. of fluorohydrocarbons with phosphate **catalysts**
)
- L15 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1995:947221 HCAPLUS
DN 123:339132
TI Liquid-phase fluorination of organic compounds in fluoropolymer
reactors
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
IN Kimura, Masumi; Yokoyama, Takaaki
PI JP 07233102 A2 950905 Heisei
AI JP 94-24419 940222
PY 1995
AB Org. compds. are fluorinated in liq. phase using HF by feeding HF
and the org. compds. in their gaseous states to a reactor made of
fluoropolymers. The reaction may be carried out in the presence of
Lewis acid catalysts. The method effectively gives products without
corrosion of reactors. CH₂Cl₂, HF, and Cl were evapd. and fed to a
SUS 304 reactor lined with perfluoroalkoxy polymer, where SbCl₅ was
placed, at 100.degree. and 5 kg/cm²G to give CH₂F₂ and CH₂FCl with
selectivity 92.9 and 7.1%, resp., at conversion 96.4%. A control
reaction using an unlined reactor caused corrosion of 50 mm/yr after
a 50 h operation.
- IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)
(liq.-phase fluorination of org. compds. by feeding gaseous HF
and materials to fluoropolymer reactors)
- IT **75-09-2, Dichloromethane, reactions**
7664-39-3, Hydrogen fluoride, reactions
RL: RCT (Reactant)
(liq.-phase fluorination of org. compds. by feeding gaseous HF
and materials to fluoropolymer reactors)
- L15 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1995:787308 HCAPLUS

DN 123:169227
TI Process for producing **difluoromethane** and tetrafluoroethane
SO PCT Int. Appl., 32 pp.
CODEN: PIXXD2
IN Homoto, Yukio; Tanaka, Kunitada; Shibamura, Takashi; Komatsu, Satoshi; Koyama, Satoshi
PI ~~WO 9515937 A1 950615~~
AI WO 94-JP2070 941209
PY 1995
AB This patent application describes a process for producing **difluoromethane** and tetrafluoroethane comprising the steps of: (1) reacting methylene chloride and 1,1,2-trichloroethylene with hydrogen fluoride in a first reactor in a gas phase in the presence of a **fluorination catalyst** and 1,1,1,2-tetrafluoroethane, and (2) reacting 1,1,1-trifluorochloroethane with **hydrogen fluoride** in a second reactor in a gas phase in the presence of a **fluorination catalyst**, and supplying a reaction mixt. formed in the second reactor to the first reactor. This process makes it possible to obtain **difluoromethane** with high conversion and high selectivity by **fluorination** of methylene chloride using a large amt. of **hydrogen fluoride** which is also necessary for producing 1,1,1,2-tetrafluoroethane. *equi*

IT **75-10-5P, Difluoromethane**
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(process for producing **difluoromethane** and tetrafluoroethane)

IT **75-09-2, Methylene chloride, reactions 7664-39-3, Hydrogen fluoride, reactions**
RL: RCT (Reactant)
(process for producing **difluoromethane** and tetrafluoroethane)

L15 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1995:589470 HCAPLUS
DN 122:323362
TI Chromium-based **fluorination catalyst** for manufacture of **hydrofluorocarbons** from halogenated **hydrocarbons**
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
IN Tsuji, Katsuyuki; Nakaji, Tetsuo
PI ~~EP 641598 A2 950308~~
AI ~~EP 94-113719 940901~~
PY 1995
AB The catalyst is prepd. by firing a substance contg. Cr(OH)3 in the presence of H at a temp. of 350-500.degree. or by heat-treating the Cr(OH)3 in an inert gas stream at a temp. of 100-600.degree. and then firing the heat-treated compd. in the presence of H at the above temp. to grow cryst. Cr2O3. The catalyst is then fluorinated with HF at 300-500.degree.. Halogenated C1-4 hydrocarbon are brought into contact with gaseous HF in the presence the catalyst to produce **hydrofluorocarbons** (HFC) and **hydrochlorofluorocarbon** (HCFC). High yields of HFC's and HCFC's are obtained at relatively low temps. *jet*

IT **7664-39-3, Hydrogen fluoride, reactions**
RL: RCT (Reactant)
(chromium-based **fluorination catalyst** for manuf. of **hydrofluorocarbon** from halogenated **hydrocarbons**)

IT **75-09-2, Dichloromethane, reactions**
RL: RCT (Reactant)
(chromium-based **fluorination catalyst** for

- manuf. of **hydrofluorocarbons** from halogenated **hydrocarbons**)
- IT 75-10-5P, Difluoromethane
RL: SPN (Synthetic preparation); PREP (Preparation)
(chromium-based **fluorination catalyst** for
manuf. of **hydrofluorocarbons** from halogenated **hydrocarbons**)
- L15 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1995:380352 HCAPLUS
DN 122:136766
TI **Fluorination catalyst** and **fluorination**
process
SO Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
IN Tsuji, Katsuyuki; Oshiro, Kimitaka; Nakajo, Tetsuo
PI EP 629440 A1 941221
AI EP 94-109099 940614
PY 1994
AB The **catalyst**, which is used for **fluorination** of
halogenated **hydrocarbons** for producing
hydrofluorocarbons with high yield, comprises indium,
chromium, oxygen and fluorine as essential constituent elements.
The **catalyst** is prep'd. by fluorinating a **catalyst**
precursor comprising indium and chromium elements by bringing it
into contact with **hydrogen fluoride** or a
fluorine-contg. halogenated **hydrocarbon** at
300-500.degree..
- IT 75-10-5P, HFC 32
RL: IMF (Industrial manufacture); PREP (Preparation)
(**fluorination catalyst** and
fluorination process for prodn. of
hydrofluorocarbons)
- IT 75-09-2, reactions
RL: RCT (Reactant)
(**fluorination catalyst** and
fluorination process for prodn. of
hydrofluorocarbons)
- L15 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1995:245129 HCAPLUS
DN 122:9439
TI Room-temperature catalytic fluorination of C1 and C2 chlorocarbons
and chlorohydrocarbons on fluorinated Fe3O4 and Co3O4
SO J. Chem. Soc., Faraday Trans. (1994), 90(23), 3585-90
CODEN: JCFTEV; ISSN: 0956-5000
AU Thomson, James
PY 1994
AB A study of the room-temp. reactions of a series of C1 and C2
chlorohydrocarbon and chlorocarbon substrate mols. with fluorinated
iron(II,III) oxide and cobalt(II,III) oxide has been conducted. The
results show that fluorinated iron(II,III) oxide exhibits an ability
to incorporate fluorine into the following substrates in the order:
Cl2C:CCl2 > H2C:CCl2 > CH3CCl3 > CHCl3 > CHCl3 > CH2Cl2 > CH2ClCCl3
> CCl4 > CHCl2CHCl2. The fluorinated cobalt(II,III) oxide gave the
reactivity series CHCl3 > CCl4 > H2C:CCl2 > CHCl2CHCl2 > CH2Cl2 >
CH3CCl3 > CCl2:CCl2 > CH2ClCl3. Reactions of C1 chlorohydrocarbon
or chlorocarbon probe mols. with fluorinated Fe3O4 gave
predominately C1 chlorofluorohydrocarbon and chlorofluorocarbon
products, resp., whereas fluorinated cobalt(II,III) oxide produced
predominantly C2 chlorofluorohydrocarbon and chlorofluorocarbons.
For fluorinated Co3O4, the distribution of C2 products obtained from
C1 chlorohydrocarbon precursor mols. is consistent with the
formation of radical intermediates at strong Lewis acid surfaces.
C2 chlorohydrocarbons exhibit a fluorine for chlorine (F-for-Cl)
exchange reaction through the catalytic dehydrochlorination of the
- get

substrate to the alkenic intermediate. The F-for-Cl exchange process was dependent upon the ability of the substrate material to undergo dehydrochlorination; the inability of a substrate to undergo dehydrochlorination results in the fluorination process proceeding through the formation of chlorocarbon or chlorohydrocarbon radical intermediates.

IT 75-09-2, Dichloromethane, reactions

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process)

(room-temp. catalytic fluorination of C1 and C2 chlorocarbons and chlorohydrocarbons on fluorinated Fe3O4 and Co3O4)

L15 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1995:128302 HCAPLUS

DN 122:9477

TI Preparation of **difluoromethane** from **dichloromethane**

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

IN Tsuji, Katsuyuki; Kaga, Kazuaki; Tomota, Seiichi; Nakajo, Tetsuo; Nakayama, Hidetoshi

PI JP 06211707 A2 940802 Heisei

AI JP 93-5188 930114

PY 1994

AB CH2F2 (I) is prepd. by **fluorination** of CH2Cl2 (II) by HF in gas phases in presence of **catalysts**, which contain Zn, Cr, O, and F and have 5-50% **fluorination** ratio expressed by $[Y/(2X + 3)] \times 100\%$ (where $X = \text{Zn/Cr at. ratio}$, $Y = \text{F/Cr at. ratio}$) and 0.01-0.6 Zn/Cr at. ratio. A mixt. of Cr(NO3)3.9H2O, Zn(NO3)2.6H2O, and NH3 in H2O was stirred and the resulting slurry was dried, pelletized, heated at 400.degree. for 4 h, and treated with HF at 400.degree. to prep. a **catalyst** contg. Zn 11.8, Cr 52.5, O 23.2, and F 9.5 wt.%. II was fluorinated by HF with the **catalyst** at 180.degree. to give 57.0% I.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(prepn. of CH2F2 by **fluorination** of CH2Cl2 by HF with Cr-Zn-F **catalysts**)

IT 75-09-2, Dichloromethane, reactions

7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(prepn. of CH2F2 by **fluorination** of CH2Cl2 by HF with Cr-Zn-F **catalysts**)

L15 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:680250 HCAPLUS

DN 121:280250

TI Preparation of **difluoromethane**

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

IN Boniface, David William; Scott, John David; Watson, Michael John

PI WO 9421579 A1 940929

AI WO 94-GB497 940314

PY 1994

AB CH2F2 was prepd. by (a) contacting CH2Cl2 with HF in the presence of a **fluorination catalyst** to produce a product stream comprising CH2F2, CH2ClF, and unreacted starting materials and (b) sepg. CH2F2 from the product stream from step (a); sufficient HF is employed in the process such that during step (b) the molar ratio of HF to CH2ClF is .gtoreq.100:1. The high-ratio of HF to CH2ClF mitigates toxicity problems, assocd. with the latter compd. Thus, a tube reactor contg. Zn/Cr oxide **catalyst** was pretreated with HF at 300.degree. for 24 h; the reactor was cooled to 250.degree., pressurized with 10 bar N, and a 27.1:1 molar ratio of HF:CH2Cl2 was introduced. The product stream was scrubbed

with water to remove HF and HCl leaving a mixt. of CH₂Cl₂ 1.0, CH₂ClF 7.1, and CH₂F₂ 92.0 vol. %.

IT **75-10-5P, Difluoromethane**

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(prepn. of difluoromethane)

IT **75-09-2, Dichloromethane, reactions**

7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant)

(prepn. of difluoromethane)

L15 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:579090 HCAPLUS

DN 121:179090

TI Process for reducing the **fluorine** content of **hydrofluorocarbons** and **hydrohalofluorocarbons**

SO PCT Int. Appl., 23 pp.

CODEN: PIXXD2

IN Manzer, Leo Ernest; Rao, Velliyur Nott Mallikarjuna; Swearingen, Steven Henry

PI WO 9413609 A1 940623

AI WO 93-US11526 931202

PY 1994

AB The fluorine content of acyclic satd. compds. of formula C_nF_aX_bH_c [each X = (independently) Cl or Br; n = 1-6; a = 1-13; b = 0-12; c = 1-9; (a+b+c) = (2n+2)] is reduced by reaction with HCl in the vapor phase at an elevated temp. in the presence of a catalyst, the mole ratio of HCl to the acyclic satd. compd. being at least about 1:1. Catalysts include alumina, fluorided alumina, aluminum fluoride, chromium oxide, magnesium fluoride, zinc, others, and various combinations. The method is useful for converting **fluorinated** halogenated **hydrocarbons** to others in higher com. demand or more useful as precursors, and to avoid disposal problems. For example, a CoCl₂/Al₂O₃ catalyst was fluorided with HF at 200-450.degree., then used to treat CF₃CF₂H with a 2- to 20-fold molar excess of HCl at 200-450.degree. and contact time of 30-60 s. At 450.degree., 20-fold excess HCl, and 30-s contact time, the reaction gave an effluent contg. 5.2% FC1C:CCl₂ and 81.9% Cl₂C:CCl₂. The latter is a precursor of CF₃CHCl₂ and/or CF₃CHClF, the prepn. of which generate the above CF₃CF₂H as a byproduct.

IT **75-09-2P, HCC 30, preparation**

RL: BYP (Byproduct); IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(redn. of F content of **hydro(halo)fluorocarbons**
by reaction with hydrogen chloride and catalysts)

L15 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:216698 HCAPLUS

DN 120:216698

TI Fluorination of dihalomethane

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

IN Yoshitake, Masaru; Tatematsu, Shin; Morikawa, Shinsuke

PI JP 05339179 A2 931221 Heisei

AI JP 92-179323 920612

PY 1993

AB A dihalomethane and HF are reacted in gas phase under (normal) pressure at 150-550.degree. in the presence of a **fluorination catalyst** comprising at least one metal element selected from Mn and Fe group elements (0.01-20 wt.%/alumina support) supported on an alumina, a part of its O being replaced by halogens. Besides Mn or Fe group elements, the **fluorination catalyst** addnl. contains at least one metal element selected from alk. earth metals and lanthanide elements. Halomethanes are preferably CH₂Cl₂, ClCH₂F, CH₂Br₂,

BrCH₂F, and BrCH₂Cl. The alumina support has micropore vol. .gtoreq.0.6 mL/g and surface area .gtoreq.150 m²/g, and .gtoreq.50% of its micropores have micropore diam. 100-1,000 .ANG.. O is added in the **fluorination** system. This process uses new non-chrome **catalysts** which improve conversion ratio of starting materials and show high selectivity and long-lasting activity. Thus, 1,000 g alumina was dried, fluorinated at 300-450.degree. in a stream of HF/N mixed gas, and then chlorofluorinated at 250-300.degree. in a stream of FCCl₃/HF mixed gas to give an alumina contg. 12 wt.% F and 1.5 wt.% Cl. The latter alumina was immersed in a soln. of 60 g CoCl₂.6H₂O in 2L H₂O, dried, and activated by treatment with a stream of FCCl₃/HF/N mixed gas at 250-300.degree. to give a **catalyst**. This **catalyst** (200 mL) was packed in an U-shaped reactor (inner diam. 2.54 cm, length 100 cm) and thereto CH₂Cl₂, O, and HF were introduced at 100, 2, and 200 mL/min, resp., and 360.degree. to give ClCH₂F and CH₂F₂ with 26 and 73% selectivity, resp., and 72% conversion after 3 days, and 30 and 69% selectivity, resp., and 65% conversion after 65 days. CH₂F₂ is useful as a foaming agent and a refrigerant, a potential substitute for CFC-12, HCFC-22, and CFC-115.

IT **7664-39-3, Hydrogen fluoride, reactions**

RL: RCT (Reactant)

(**fluorination** by, of methylene chloride)

IT **75-09-2, Methylene chloride, reactions**

RL: RCT (Reactant)

(**fluorination** of, by **hydrogen**

fluoride, catalysts for)

IT **75-10-5P, Difluoromethane**

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of, by **fluorination** of methylene

chlorofluoromethane with **hydrogen**

fluoride, catalysts for)

L15 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1994:163446 HCAPLUS

DN 120:163446

TI Preparation of **hydrofluoroalkanes**

SO PCT Int. Appl., 40 pp.

CODEN: PIXXD2

IN Powell, Richard Llewellyn; Scott, John David; Shields, Charles John; Bonniface, David William

PI WO 9325505 A1 931223

AI WO 93-GB1207 930608

PY 1993

AB The title process comprises co-prodn. of two or more **hydrofluoroalkanes** by contacting an alkene or a halogenated alkane with HF at an elevated temp. in the presence of a **fluorination catalyst** to produce a first **hydrofluoroalkane** and wherein an org. precursor to a second **hydrofluoroalkane** is provided in the process whereby a second **hydrofluoroalkane** is produced in addn. to the first **hydrofluoroalkane**. Thus, CF₃CH₂Cl (I) contg. 0.43 vol.% C₂ClF₄ was supplied to a reactor contg. a chromia **catalyst** at 330.degree. to give a product comprising I 79.36, CF₃CFH₂ 17.86, and, e.g., C₂HF₅ 0.43 vol.%.

IT **75-09-2, Methylene chloride, reactions**

RL: RCT (Reactant)

(**fluorination** of)

IT **75-10-5P, Difluoromethane**

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of, method for)

L15 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1993:472238 HCAPLUS

DN 119:72238

TI Reactivation of chromium **catalysts** for

- fluorination** of halohydrocarbons
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
- IN Tsuji, Katsuyuki; Tomota, Seiichi; Ooshiro, Kimitaka; Hirayama, Hideji; Nakayama, Hidetoshi
PI JP 05092141 A2 930416 Heisei
AI JP 91-126196 910529
PY 1993
- AB The title **catalysts** are reactivated by treatment with oxidizing gases at 150-500.degree. followed by reducing gases at 100-500.degree.. CrCl₃ was supported on activated Al₂O₃, calcined at 400.degree. for 3 h under air and at 350.degree. for 3 h under H₂, and treated with HF to prep. a **catalyst**, which was used in **fluorination** of HCFC 133a by HF at 300.degree. for 300 h. The **catalyst** was reactivated by treatment with air-N mixt. at 350.degree. for 10 h, H-N mixt. at 350.degree. for 2 h, and HF at 330.degree. and used in the **fluorination** again to result in 19.8% HCFC 133a conversion and 98.7% selectivity to give HFC 134a after 5 h, vs. 19.9 and 98.6%, resp., in the 1st reaction.
- IT **75-09-2, Dichloromethane, reactions**
RL: RCT (Reactant)
(**fluorination** of, reactivation of chromium **catalysts** for)
- IT **75-10-5P, Difluoromethane**
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, reactivation of chromium **catalysts** for)
- L15 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1993:427696 HCAPLUS
DN 119:27696
TI Manufacture of **hydrofluorocarbons**
SO U.S., 3 pp.
CODEN: USXXAM
- IN Elsheikh, Maher Y.
PI US 5208395 A 930504
AI US 92-866772 920406
PY 1993
- AB The title process comprises the gas-phase reaction of 1,1-**dichloroalkanes** (e.g. **dichloromethane** or 1,1-**dichloroethane**) with **hydrogen fluoride** in the presence of a supported tin tetrachloride catalyst. A tubular reactor was charged with a tin tetrachloride/activated carbon catalyst (117 g contg. 0.0017 mol tin tetrachloride) and the catalyst was activated with hydrofluoric acid. This catalyst was used for the conversion of HFC 150a (1,1-dichloroethane) to HFC 152a (1,1-difluoroethane), a potential foam blowing agent.
- IT **75-09-2, R 30, reactions**
RL: RCT (Reactant)
(**fluorination** of, with **hydrofluoric** acid, tin tetrachloride as **catalyst** for)
- IT **75-10-5P, Freon 32**
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, by **fluorination** of R 30 with hydrofluoric acid, tin tetrachloride as **catalyst** for)
- L15 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 1998 ACS
AN 1993:21935 HCAPLUS
DN 118:21935
TI Fluorination of halogenated alkanes using transition metal fluorides
SO Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
- IN Dukat, Wolfgang Willi; Holloway, John Henry; Hope, Eric George; Rieland, Matthias; Townson, Paul John; Powell, Richard Llewellyn
PI EP 503792 A1 920916
AI EP 92-301531 920224
PY 1992

AB Fluorinated alkanes were prepd. by fluorination of alkyl halides contg. at least one Cl, Br or iodine atom by F in the presence of a transition metal fluoride selected from OsF₆, IrF₆, ReF₆, RuF₅, etc. Thus, fluorination of CH₂Cl₂ at -78 to +20.degree. by F in the presence of UF₆ gave CHCl₂F with 99.9% selectivity.

IT 75-09-2, Methylene chloride, reactions

RL: RCT (Reactant)
(fluorination of)

IT 7664-39-3P, Hydrogen fluoride, preparation

RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, by fluorination of methylene chloride)

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, by fluorination of methylene chloride)

L15 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1993:6616 HCAPLUS

DN 118:6616

TI Fluorination of halogenated alkanes using transition metal oxide fluorides

SO Eur. Pat. Appl., 8 pp.

CODEN: EPXXDW

IN Holloway, John Henry; Hope, Eric George; Townson, Paul John; Powell, Richard Llewellyn

PI EP 503793 A1 920916

AI EP 92-301532 920224

PY 1992

AB Fluoroalkanes were prepd. by fluorination of halogenated alkanes contg. at least one Cl, Br, or iodine atom by F in the presence of a transition metal oxide fluoride. Thus, fluorination of CH₂Cl₂ by F in the presence of ReOF₄ at -78 to +20.degree. gave CH₂ClF in 97.5% yield.

IT 75-09-2, Methylene chloride, reactions

RL: RCT (Reactant)
(fluorination of, by fluorine)

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, by fluorination of methylene bromide)

L15 ANSWER 21 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1990:615192 HCAPLUS

DN 113:215192

TI Preparation of catalysts for synthesis of **fluorine**-containing halogenated **hydrocarbons**

SO Ger. (East), 3 pp.

CODEN: GEXXA8

IN Kemnitz, Erhard; Hass, Dieter; Roennebeck, Matthias; Schmidt, Udo; Kaden, Reinfried; Henke, Christian

PI DD 276431 A1 900228

AI DD 88-321224 881031

PY 1990

AB A method for prepn. of **catalysts** for synthesis of F-contg. halogenated hydrocarbons with Al₂O₃ as support and Al-F compds. as active components comprises adding .gamma.-Al₂O₃ to a soln. of ammonium- or alkylammonium fluoride at 290-370 K to ppt. ammonium- or alkylammonium fluoroaluminate. Suitable alkylammonium fluoride includes Me or Et ammonium fluoride. The **catalysts** are esp. useful for **fluorination** of chloroalkanes to low- and intermediately fluorinated compds. with high yields. The compds. obtained are useful as coolants, aerating gases, corrosive gases, and solvents.

L15 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 1998 ACS

AN 1990:615191 HCAPLUS

DN 113:215191

- TI Preparation of catalysts for synthesis of **fluorine**
-containing halogenated **hydrocarbons**
- SO Ger. (East), 3 pp.
CODEN: GEXXA8
- IN Kemnitz, Erhard; Hass, Dieter; Roennebeck, Matthias; Schmidt, Udo;
Kaden, Reinfried; Henke, Christian
- PI DD 276430 A1 900228
- AI DD 88-321223 881031
- PY 1990
- AB **Catalysts** for the synthesis of F-contg. halogenated
hydrocarbons with .alpha.-Al₂O₃ or activated C as support material
and Al-F-compds. as active components are prepd. by adding the
support material to a soln. obtained by dissolving Al(OH)₃ in HF for
impregnation, and adding NH₃ or alkylamine (e.g., methylamine or
ethylamine) to ppt. ammonium- or alkylammonium fluoroaluminate. The
catalysts are esp. useful for **fluorination** of
chloroalkanes (e.g., tetrachloromethane) to obtain low- and
intermediately **fluorinated hydrocarbons** which
can be used as coolants, aerating gases, corrosive gases, and
solvents.
- IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
RL: USES (Uses)
(**catalyst** prepn. from, for **fluorination** of
chloroalkanes)
- L15 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 1998 ACS
- AN 1990:101137 HCAPLUS
- DN 112:101137
- TI Preparation, characterization, and activity of fluorinated aluminas
for halogen exchange
- SO J. Catal. (1989), 120(2), 387-400
CODEN: JCTLA5; ISSN: 0021-9517
- AU Hegde, R. I.; Barteau, M. A.
- PY 1989
- AB Fluorinated aluminas with .alpha.-AlF₃ content .ltoreq.90% were
prepd. by treatment with the fluoroalkanes CHF₃ or C₂H₅F at 773 K.
XPS results suggested that nearly complete **fluorination** of
the surface occurs even at low extents of bulk **fluorination**
. Neither .gamma.-Al₂O₃ nor .alpha.-AlF₃ exhibited significant
activity for reaction of CHF₃ following adsorption at 300 K and
subsequent temp.-programmed desorption. In contrast, partially
fluorinated aluminas strongly adsorbed CHF₃, CHClF₂, and CHCl₂F.
Temp.-programmed desorption expts. indicated that all three compds.
desorb from partially fluorinated alumina at >500 K; all reacted to
liberate HF and CO₂, and the chlorine-contg. species underwent
fluorine-for-chlorine exchange to produce CHF₃. These results
suggested that such halogen-exchange reactions could be carried out
with materials resembling conventional **fluorination**
catalysts.
- L15 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 1998 ACS
- AN 1982:491669 HCAPLUS
- DN 97:91669
- TI **Catalyst** for **fluorination** of organic
chlorocompounds
- SO Chim. Ind. (Milan) (1982), 64(3), 135-40
CODEN: CINMAB; ISSN: 0009-4315
- AU Marangoni, Luigi; Rasia, Giorgio; Gervasutti, Claudio; Colombo,
Luigi
- PY 1982
- AB Cr(OH)₃ free of ionic impurities [from NH₄OH pptn. of dil.
KCr(SO₄)₂.cntdot.12H₂O] was dried and calcined at 450-550.degree. to
give a long lived **fluorination catalyst**. The
gaseous **fluorination** of CCl₄, CHCl₃, CH₂Cl₂, C₂Cl₆,
C₂HCl₅, ClCH:CCl₂, C₂Cl₄, C₂Cl₃F₃, C₂Cl₂F₄, (CCl₃)₂CO, and CF₃CH₂Cl
with HF over the **catalyst** is described.

IT 7664-39-3, reactions
RL: RCT (Reactant)
(catalytic fluorination of chlorocarbons with)
IT 75-09-2, reactions
RL: RCT (Reactant)
(catalytic fluorination of, with hydrogen
fluoride)
IT 75-10-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of)

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1 75-09-2/BI
(75-09-2/RN)
1 75-10-5/BI
(75-10-5/RN)
1 7664-39-3/BI
(7664-39-3/RN)
L16 3 (75-09-2/BI OR 75-10-5/BI OR 7664-39-3/BI)

=> d ide can 116 1-3

L16 ANSWER 1 OF 3 REGISTRY COPYRIGHT 1998 ACS
RN 7664-39-3 REGISTRY
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN Alsurf 45
CN Anhydrous hydrofluoric acid
CN Antisal 2b
CN Fluorhydric acid
CN Fluoric acid
CN Fluorine hydride (FH)
CN Fluorine monohydride

CN Hydrofluoric acid gas
CN Hydrogen fluoride
CN Hydrogen fluoride (HF)
CN Hydrogen monofluoride
DR 32057-09-3
MF F H
CI COM
LC STN Files: AGRICOLA, ANABSTR, APILIT, APILIT2, APIPAT, APIPAT2,
BIOBUSINESS, BIOSIS, CA, CABA, CANCERLIT, CAPLUS, CASREACT, CEN,
CHEMCATS, CHEMINFORMRX, CHEMLIST, CBNB, CHEMSAFE, CIN, CJACS,
CSCHEM, CSNB, DETHERM*, DIPPR*, EMBASE, GMELIN*, HSDB*, IFICDB,
IFIPAT, IFIUDB, IPA, MEDLINE, MRCK*, MSDS-OHS, NIOSHTIC, PDLCOM*,
PIRA, PNI, PROMT, RTECS*, TOXLINE, TOXLIT, TRCTHERMO*, TULSA,
ULIDAT, USPATFULL, VTB
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Other Sources: DSL**, EINECS**, TSCA**
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HF

23255 REFERENCES IN FILE CA (1967 TO DATE)
170 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
23287 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 129:117264
REFERENCE 2: 129:116778
REFERENCE 3: 129:116722
REFERENCE 4: 129:116721
REFERENCE 5: 129:116246
REFERENCE 6: 129:116157
REFERENCE 7: 129:116154
REFERENCE 8: 129:115039
REFERENCE 9: 129:115004
REFERENCE 10: 129:114939

L16 ANSWER 2 OF 3 REGISTRY COPYRIGHT 1998 ACS
RN 75-10-5 REGISTRY
CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN Difluoromethane
CN Ecolo Ace 32
CN FC 32
CN Freon 32
CN Genetron 32
CN HFC 32
CN Methylene difluoride
CN R 32
CN R 32 (refrigerant)
FS 3D CONCORD
MF C H2 F2
CI COM
LC STN Files: ANABSTR, BEILSTEIN*, BIOBUSINESS, BIOSIS, CA,
CANCERLIT, CAOLD, CAPLUS, CASREACT, CEN, CHEMCATS, CHEMINFORMRX,
CHEMLIST, CBNB, CIN, CJACS, CSCHEM, CSNB, DETHERM*, DIPPR*,
GMELIN*, HODOC*, IFICDB, IFIPAT, IFIUDB, MEDLINE, MSDS-OHS,

NIOSHTIC, PDLCOM*, PROMT, RTECS*, SPECINFO, TOXLINE, TOXLIT,
TRCTHERMO*, ULIDAT, USPATFULL, VTB
(*File contains numerically searchable property data)
Other Sources: EINECS**, NDSL**, TSCA**
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F-CH₂-F

1643 REFERENCES IN FILE CA (1967 TO DATE)
5 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
1649 REFERENCES IN FILE CAPLUS (1967 TO DATE)
127 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 129:114146
REFERENCE 2: 129:113771
REFERENCE 3: 129:110676
REFERENCE 4: 129:110399
REFERENCE 5: 129:108794
REFERENCE 6: 129:100554
REFERENCE 7: 129:97107
REFERENCE 8: 129:97069
REFERENCE 9: 129:97068
REFERENCE 10: 129:97067

L16 ANSWER 3 OF 3 REGISTRY COPYRIGHT 1998 ACS
RN 75-09-2 REGISTRY
CN Methane, dichloro- (8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:

CN Aerothene MM
CN Dichloromethane
CN F 30
CN F 30 (chlorocarbon)
CN Freon 30
CN HCC 30
CN Khladon 30
CN Metaclen
CN Methane dichloride
CN Methylene chloride
CN Methylene dichloride
CN Narkotil
CN R 30
CN R 30 (refrigerant)
CN Solaesthin
CN Soleana VDA
CN Solmethine
FS 3D CONCORD
MF C H2 Cl2
CI COM
LC STN Files:

AGRICOLA, ANABSTR, APILIT, APILIT2, APIPAT, APIPAT2,
BEILSTEIN*, BIOBUSINESS, BIOSIS, CA, CABA, CANCERLIT, CAOLD,
CAPLUS, CASREACT, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CBNB,
CHEMSAFE, CIN, CJACS, CSCHEM, CSNB, DETHERM*, DDFU, DIPPR*, DRUGU,
EMBASE, GMELIN*, HODOC*, HSDB*, IFICDB, IFIPAT, IFIUDB, IPA,
MEDLINE, MRCK*, MSDS-OHS, NAPRALERT, NIOSHTIC, PDLCOM*, PIRA, PNI,
PROMT, RTECS*, SPECINFO, TOXLINE, TOXLIT, TRCTHERMO*, PULSA,

ULIDAT, USAN, USPATFULL, VTB
(*File contains numerically searchable property data)
Other Sources: DSL**, EINECS**, TSCA**
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Cl-CH₂-Cl

15326 REFERENCES IN FILE CA (1967 TO DATE)
68 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
15353 REFERENCES IN FILE CAPLUS (1967 TO DATE)
7 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 129:117214
REFERENCE 2: 129:115689
REFERENCE 3: 129:115589
REFERENCE 4: 129:114973
REFERENCE 5: 129:114733
REFERENCE 6: 129:114709
REFERENCE 7: 129:114704
REFERENCE 8: 129:113547
REFERENCE 9: 129:113147
REFERENCE 10: 129:112653

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L4	10	SEA FILE=REGISTRY	ABB=ON	PLU=ON	FH/MF
L17	743	SEA FILE=CASREACT	ABB=ON	PLU=ON	L1/RRT
L18	32	SEA FILE=CASREACT	ABB=ON	PLU=ON	L3/PRO
L19	1480	SEA FILE=CASREACT	ABB=ON	PLU=ON	L4/RRT
L20	10	SEA FILE=CASREACT	ABB=ON	PLU=ON	L17 AND L18 AND L19

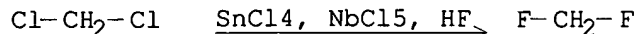
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=> d bib abs crd 1-10

L20 ANSWER 1 OF 10 CASREACT COPYRIGHT 1998 ACS
AN 128:101814 CASREACT
TI Fluorination of hydrohalomethanes using hydrogen fluoride in the presence of Lewis acid catalysts.
IN Thenappan, Alagappan; Smith, Addison Miles; McKown, Jeffrey Warren; Bell, Robert Louis
PA Alliedsignal Inc., USA
SO PCT Int. Appl., 23 pp.
CODEN: PIXXD2
PI WO 9749655 A1 971231
DS W: JP, KR
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
AI WO 97-US10966 970624
PRAI US 96-672005 960624
DT Patent
LA English
AB Fluorination catalysts comprising Mo(V) halides, Nb(V) halides, Ta(V) halides, Sn(IV) halides, Ti(IV) halides, and mixts., are claimed. Thus, CH2Cl2 was autoclaved under 300-400 psig HF at 120.degree. for 5 h in the presence of NbCl5/SnCl4 to give CH2CF2 with 99.7% selectivity and 98.8% conversion.

RX(1) OF 1



NOTE: 120.degree., 300-400 psig, 98.8% conversion, 99.7% selectivity

L20 ANSWER 2 OF 10 CASREACT COPYRIGHT 1998 ACS

AN 126:263837 CASREACT

TI Vapor-phase process and catalysts for the production of difluoromethane from hydrogen fluoride and dichloromethane

IN Clemmer, Paul Gene; Smith, Addison Miles; Tung, Hsueh Sung; Bass, John Stephen

PA Alliedsignal Inc., USA

SO PCT Int. Appl., 14 pp.

CODEN: PIXXD2

PI WO 9711043 A1 970327

DS W: AL, AU, BB, BG, BR, CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MW, MX, NO, NZ, PL, RO, SD, SG, SI, SK, TR, TT, UA, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG

AI WO 96-US14734 960913

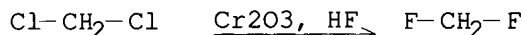
PRAI US 95-530649 950920

DT Patent

LA English

AB Difluoromethane (i.e., HFC-32; I) is prepd. in high yield and selectivity by: (A) preheating a mixt. of HF (II) and Cl₂CH₂ (III) to form a vaporized and superheater compn.; (B) reacting this superheated compn. in the presence of a fluorination catalyst (e.g., Cr₂O₃/Al₂O₃) to form a product stream contg. F₂CH₂, ClFCH₂ (IV), HCl (V), Cl₂CH₂, and HF; (C) distg. the product stream to produce a high-boiling stream comprising II, III, and IV, and a low-boiling stream comprising I, II, and V; and (D) recovering substantially pure I from the low-boiling distn. fraction.

RX(1) OF 1



NOTE: vapor-phase process; catalyst supported on alumina

L20 ANSWER 3 OF 10 CASREACT COPYRIGHT 1998 ACS

AN 126:143889 CASREACT

TI Catalytic gas-phase fluorination synthesis of difluoromethane from dichloromethane and hydrogen fluoride

IN Requieme, Benoit; Lacroix, Eric; Lantz, Andre

PA Elf Atochem S.A., Fr.

SO Eur. Pat. Appl., 8 pp.

CODEN: EPXXDW

PI EP 751107 A1 970102

DS R: BE, DE, ES, FR, GB, GR, IT, NL

AI EP 96-401150 960529

PRAI FR 95-7705 950627

DT Patent

LA French

AB CH₂F₂ is prepd. by the reaction of CH₂Cl₂ (I) with anhyd. HF in the presence of 0.1-5 mol O₂ per 100 mol of I at 330-450.degree. in the presence of an optionally supported Cr catalyst.

RX(1) OF 1



NOTE: gas-phase process

L20 ANSWER 4 OF 10 CASREACT COPYRIGHT 1998 ACS

AN 125:247197 CASREACT

TI Process and catalysts for the preparation of difluoromethane
hydrogen fluoride and dichloromethane

IN Wilmet, Vincent; Janssens, Francine

PA Solvay et Cie., Belg.

SO Eur. Pat. Appl., 5 pp.

CODEN: EPXXDW

PI EP 732314 A1 960918

DS R: DE, ES, FR, GB, IT, NL

AI EP 96-200591 960305

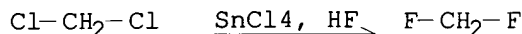
PRAI FR 95-3185 950316

DT Patent

LA French

AB Difluoromethane is prepd. in high yield and purity by the reaction
of hydrogen fluoride and dichloromethane in the presence of a metal
halide catalyst (e.g., SnCl_4).

RX(1) OF 1



L20 ANSWER 5 OF 10 CASREACT COPYRIGHT 1998 ACS

AN 124:342628 CASREACT

TI Method for the preparation of difluoromethane

IN Nam, Kyung H.; Na, Doo C.; Kim, Dae S.

PA Ulsan Chemical Co., Ltd., S. Korea

SO U.S., 6 pp.

CODEN: USXXAM

PI US 5495057 A 960227

AI US 95-398965 950302

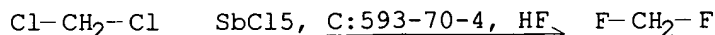
PRAI KR 94-38154 941228

DT Patent

LA English

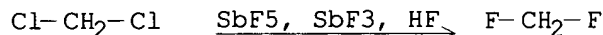
AB A method for the prepn. of CH_2F_2 is disclosed, wherein CH_2Cl_2 reacts
with HF in the liq. phase, at 70.degree.-90.degree. and approx.
11-12 kg/cm²G, in the presence of SbCl_5 catalyst. It is important
that the concn. of pentavalent Sb is maintained at a level of 85% or
more, with the feed mole ratio of HF to CH_2Cl_2 ranging from about
2.0 to 2.3. Applicable to industrial scale, the method is operated
in a batch or continuous system. In addn., it exhibits superior
conversion and prodn. yield. In an example with a mol ratio
 $\text{SbCl}_5/\text{CH}_2\text{Cl}_2$ of 0.17/1 and $\text{HF}/\text{CH}_2\text{Cl}_2$ of 2.0/1, the conversion rates
of CH_2Cl_2 and HF were 93.6% and 86.92% by wt., and the product
contained 93.52% CH_2F_2 and 6.48% CH_2ClF .

RX(1) OF 1

NOTE: 70-90.degree. and 11-12 kg/cm²G, mol ratio $\text{HF}/\text{CH}_2\text{Cl}_2 = 2.0-2.3$,
91.7-93.6% conversion of CH_2Cl_2 , product ratio $\text{CH}_2\text{F}_2/\text{CH}_2\text{FCl} =$
(93.52-86.35%)/(6.48-13.65%)

L20 ANSWER 6 OF 10 CASREACT COPYRIGHT 1998 ACS
 AN 124:288753 CASREACT
 TI Process for producing difluoromethane
 IN Yamada, Yasufu; Shibamura, Takashi; Tsuda, Takehide
 PA Daikin Industries Ltd., Japan
 SO PCT Int. Appl., 16 pp.
 CODEN: PIXXD2
 PI WO 9601241 A1 960118
 DS W: AU, BR, CA, CN, JP, KR, RU, US
 RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
 AI WO 95-JP1320 950703
 PRAI JP 94-151151 940701
 DT Patent
 LA Japanese
 AB This patent application describes a process for producing difluoromethane by the reaction of dichloromethane with hydrogen fluoride in the presence of a catalyst in a liq. phase economically and safely, wherein the reaction is conducted by using antimony pentafluoride or a mixt. thereof with antimony trifluoride as the catalyst at a temp. of 80-150.degree.C under a pressure of 8-80 kg/cm2.

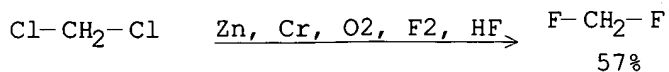
RX(1) OF 1



NOTE: 100.degree.

L20 ANSWER 7 OF 10 CASREACT COPYRIGHT 1998 ACS
 AN 122:9477 CASREACT
 TI Preparation of difluoromethane from dichloromethane
 IN Tsuji, Katsuyuki; Kaga, Kazuaki; Tomota, Seiichi; Nakajo, Tetsuo; Nakayama, Hidetoshi
 PA Showa Denko Kk, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 PI JP 06211707 A2 940802 Heisei
 AI JP 93-5188 930114
 DT Patent
 LA Japanese
 AB CH2F2 (I) is prepd. by fluorination of CH2Cl2 (II) by HF in gas phases in presence of catalysts, which contain Zn, Cr, O, and F and have 5-50% fluorination ratio expressed by $[Y/(2X + 3)] \times 100\%$ (where X = Zn/Cr at. ratio, Y = F/Cr at. ratio) and 0.01-0.6 Zn/Cr at. ratio. A mixt. of Cr(NO3)3.9H2O, Zn(NO3)2.6H2O, and NH3 in H2O was stirred and the resulting slurry was dried, pelletized, heated at 400.degree. for 4 h, and treated with HF at 400.degree. to prep. a catalyst contg. Zn 11.8, Cr 52.5, O 23.2, and F 9.5 wt.%. II was fluorinated by HF with the catalyst at 180.degree. to give 57.0% I.

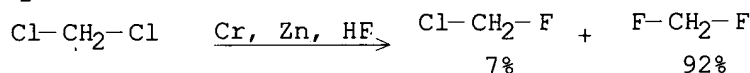
RX(1) OF 1



L20 ANSWER 8 OF 10 CASREACT COPYRIGHT 1998 ACS
 AN 121:280250 CASREACT
 TI Preparation of difluoromethane
 IN Bonniface, David William; Scott, John David; Watson, Michael John

PA Imperial Chemical Industries PLC, UK
 SO PCT Int. Appl., 15 pp.
 CODEN: PIXXD2
 PI WO 9421579 A1 940929
 DS W: AU, BR, CA, CN, FI, JP, KR, NO, RU, UA, US
 RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
 AI WO 94-GB497 940314
 PRAI GB 93-6072 930324
 GB 93-6089 930324
 DT Patent
 LA English
 AB CH₂F₂ was prep'd. by (a) contacting CH₂Cl₂ with HF in the presence of a fluorination catalyst to produce a product stream comprising CH₂F₂, CH₂ClF, and unreacted starting materials and (b) sepg. CH₂F₂ from the product stream from step (a); sufficient HF is employed in the process such that during step (b) the molar ratio of HF to CH₂ClF is .gtoreq.100:1. The high ratio of HF to CH₂ClF mitigates toxicity problems assocd. with the latter compd. Thus, a tube reactor contg. Zn/Cr oxide catalyst was pretreated with HF at 300.degree. for 24 h; the reactor was cooled to 250.degree., pressurized with 10 bar N, and a 27.1:1 molar ratio of HF:CH₂Cl₂ was introduced. The product stream was scrubbed with water to remove HF and HCl leaving a mixt. of CH₂Cl₂ 1.0, CH₂ClF 7.1, and CH₂F₂ 92.0 vol. %.

RX(1) OF 1

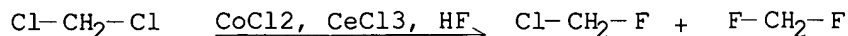


NOTE: OXIDE CATALYSTS

L20 ANSWER 9 OF 10 CASREACT COPYRIGHT 1998 ACS
 AN 120:216698 CASREACT
 TI Fluorination of dihalomethane
 IN Yoshitake, Masaru; Tatematsu, Shin; Morikawa, Shinsuke
 PA Asahi Glass Co Ltd, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 PI JP 05339179 A2 931221 Heisei
 AI JP 92-179323 920612
 DT Patent
 LA Japanese
 OS MARPAT 120:216698
 AB A dihalomethane and HF are reacted in gas phase under (normal) pressure at 150-550.degree. in the presence of a fluorination catalyst comprising at least one metal element selected from Mn and Fe group elements (0.01-20 wt.%/alumina support) supported on an alumina, a part of its O being replaced by halogens. Besides Mn or Fe group elements, the fluorination catalyst addnl. contains at least one metal element selected from alk. earth metals and lanthanide elements. Halomethanes are preferably CH₂Cl₂, ClCH₂F, CH₂Br₂, BrCH₂F, and BrCH₂Cl. The alumina support has micropore vol. .gtoreq.0.6 mL/g and surface area .gtoreq.150 m²/g, and .gtoreq.50% of its micropores have micropore diam. 100-1,000 .ANG.. O is added in the fluorination system. This process uses new non-chrome catalysts which improve conversion ratio of starting materials and show high selectivity and long-lasting activity. Thus, 1,000 g alumina was dried, fluorinated at 300-450.degree. in a stream of HF/N mixed gas, and then chlorofluorinated at 250-300.degree. in a stream of FCCl₃/HF mixed gas to give an alumina contg. 12 wt.% F and 1.5 wt.% Cl. The latter alumina was immersed in a soln. of 60 g CoCl₂.6H₂O in 2L H₂O, dried, and activated by treatment with a stream of FCCl₃/HF/N mixed gas at 250-300.degree. to give a catalyst. This catalyst (200 mL) was packed in an U-shaped reactor

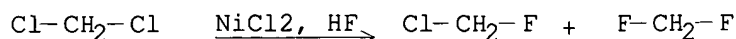
(inner diam. 2.54 cm, length 100 cm) and thereto CH_2Cl_2 , H_2O , and HF were introduced at 100, 2, and 200 mL/min, resp., and 360.degree. to give ClCH_2F and CH_2F_2 with 26 and 73% selectivity, resp., and 72% conversion after 3 days, and 30 and 69% selectivity, resp., and 65% conversion after 65 days. CH_2F_2 is useful as a foaming agent and a refrigerant, a potential substitute for CFC-12, HCFC-22, and CFC-115.

RX(1) OF 5



NOTE: gas phase; cobalt chloride and cerium chloride on chlorofluorinated alumina; 75% reaction ratio; 26 and 74% selectivity for chlorofluoromethane and difluoromethane, resp.

RX(2) OF 5



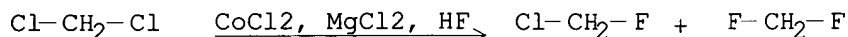
NOTE: gas phase; nickel chloride on chlorofluorinated alumina; 68% reaction ratio; 28 and 71% selectivity for chlorofluoromethane and difluoromethane, resp.

RX(3) OF 5



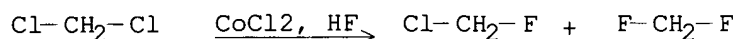
NOTE: gas phase; manganese chloride on chlorofluorinated alumina; 64% reaction ratio; 25 and 73% selectivity for chlorofluoromethane and difluoromethane, resp.

RX(4) OF 5



NOTE: gas phase; magnesium chloride and cobalt chloride on chlorofluorinated alumina; 72% reaction ratio; 22 and 77% selectivity for chlorofluoromethane and difluoromethane, resp.

RX(5) OF 5



NOTE: gas phase; cobalt chloride on chlorofluorinated alumina; 72% reaction ratio; 26 and 73% selectivity for chlorofluoromethane and difluoromethane, resp.

L20 ANSWER 10 OF 10 CASREACT COPYRIGHT 1998 ACS

AN 120:163398 CASREACT

TI High oxidation state binary transition metal fluorides as selective fluorinating agents

AU Dukat, Wolfgang W.; Holloway, John H.; Hope, Eric G.; Rieland, Matthias R.; Townson, Paul J.; Powell, Richard L.

CS Dep. Chem., Univ. Leicester, Leicester, LE1 7RH, UK

SO J. Chem. Soc., Chem. Commun. (1993), (18), 1429-30

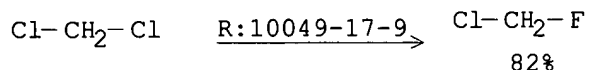
CODEN: JCCCAT; ISSN: 0022-4936

DT Journal

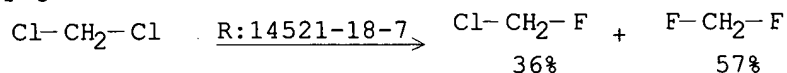
LA English

AB High oxidn. state transition metal fluorides are selective fluorinating agents for CH₂Cl₂; those with d⁰ electronic configurations undergo H-F exchange and metal redn., while dn species undergo Cl-F exchange.

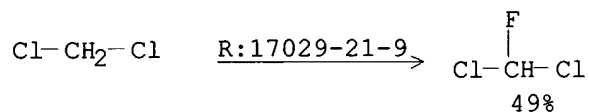
RX(1) OF 5



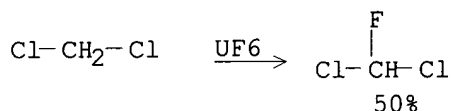
RX(2) OF 5



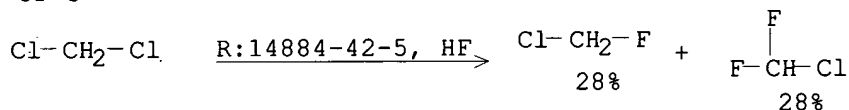
RX(3) OF 5



RX(4) OF 5



RX(5) OF 5



-1- (WPAT)

ACCESSION NUMBER
CROSS REFERENCE
SECONDARY ACCESSION
XRPX
TITLE

DERWENT CLASSES
PATENT ASSIGNEE
INVENTORS
PRIORITY
NUMBERS
PUBLICATION DETAILS

94-316864/39

94-316863

C94-144362

N94-248843

Prod'n. of di:fluoromethane - by contacting
di:chloromethane with hydrogen fluoride in presence
of zinc-contg. catalyst

E16 G04 J07 X27

(ICIL) IMPERIAL CHEM IND PLC

BONNIFACE DW, SCOTT JD, WATSON MJ

93.03.24 93GB-006089, 93.03.24 93GB-006072

12 patent(s) 29 country(s)

W09421580 AI 94.09.29 * (9439) E 12p C07C-017/20

NW: *AU *BR *CA *CN *FI *JP *KR *NO *RU *UA *US

RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT

SE

ZA9401826 A 94.11.30 (9503) 10p C07C-000/00

BR9406201 A 95.12.12 (9606) C07C-017/20

Based on W09421580

EP-690833 AI 96.01.10 (9607) E C07C-017/20

R: BE DE ES FR GB IE IT LU NL PT

Based on W09421580

JP08508029 W 96.08.27 (9702) 10p C07C-019/08

Based on W09421580

TW-290531 A 96.11.11 (9711) C07C-017/20

CN1119431 A 96.03.27 (9744) C07C-017/20

CN1119432 A 96.03.27 (9744) C07C-017/20

EP-690833 BI 98.05.20 (9824) E 4p C07C-017/20

R: BE DE ES FR GB IE IT LU NL PT

Based on W09421580

US5763704 A 98.06.09 (9830) C07C-017/08

Based on W09421580

DE69410456 E 98.06.25 (9831) C07C-017/20

Based on EP-690833

Based on W09421580

AU-691487 B 98.05.21 (9832) C07C-017/20

Previous Publ: AU9462134

Based on W09421580

CITATIONS
APPLICATION DETAILS

EP-128510, EP-502605, W09216482

94WO-GB00498 94.03.14

94ZA-001826 94.03.15

94BR-006201 94.03.14 94WO-GB00498 94.03.14

94EP-909204 94.03.14 94WO-GB00498 94.03.14

94JP-520764 94.03.14 94WO-GB00498 94.03.14

94TW-102380 94.03.18

94CN-191525 94.03.14

94CN-191526 94.03.14

94EP-909204 94.03.14 94WO-GB00498 94.03.14

94WO-GB00498 94.03.14 95US-522241 95.09.06

94DE-610456 94.03.14 94EP-909204 94.03.14

94WO-GB00498 94.03.14

94AU-062134 94.03.14

MAIN INT 'L CLASS.
SECONDARY INT 'L CLASS.
ADD 'L INT 'L CLASS.
ABSTRACT

C07C-000/00 C07C-017/08 C07C-017/20 C07C-019/08

B01J-027/12

C07B-061/00

W09421580 A

Prod'n. of difluoromethane comprises contacting

dichloromethane with HF over a n or Zn oxide, fluoride or oxyfluoride catalyst. The catalyst pref., contains a cpd. of Zn and chromia, chromium fluoride or chromium oxyfluoride.

USE/ADVANTAGE - Difluoromethane (HFA-32) is useful as a replacement for ozone-layer damaging chlorofluorocarbons; for blending with other hydrofluoroalkanes, e.g. HFA-134a and HFA-125; as a replacement for R-22 and R-502 in refrigeration, air conditioning and other applications, e.g. foam expansion cleaning solvents and aerosol propellants. Selectivity to difluoromethane is increased and the amts. of highly toxic by-prod. monochloromonofluoromethane (HCFC-31) are substantially reduced e.g. from greater than 20% to e.g. 7%. The reaction may be run at lower temps. than prior art, resulting in longer catalyst lifetimes. Increased temps. do not result in higher levels of HCFC-31, as with prior catalysts. (Dwg. 0/0)

-2- (WPAT)

ACCESSION NUMBER

94-316863/43

CROSS REFERENCE

94-316864

SECONDARY ACCESSION

C94-144361

XRPX

N94-248842

TITLE

Di:fluoro:methane prepn. process - by reacting di:chloro:methane with hydrogen fluoride in presence of catalyst with reduced prodn. of chloro:fluoro:methane

DERWENT CLASSES

E16 G04 J07 X27

PATENT ASSIGNEE

(ICIL) IMPERIAL CHEM IND PLC

INVENTORS

BONNIFACE DW, SCOTT JD, WATSON MJ

PRIORITY

93.03.24 936B-00607/2 93.03.24 936B-0060891

NUMBERS

12 patent(s) 28 country(s)

PUBLICATION DETAILS

W09421579 AI 94.09.29 * (9443) E 15p C07C-017/20
 NW: *AU *BR *CA *CN *FI *JP *KR *NO *RU *UA *US
 RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT
 SE
 ZA9401818 A 94.11.30 (9503) 15p C07C-000/00
 AU9462133 A 94.10.11 (9504) C07C-017/20
 Based on W09421579
 AU9462134 A 94.10.11 (9504) C07C-017/20
 Based on W09421580
 EP-690832 AI 96.01.10 (9607) E C07C-017/20
 R: BE DE ES FR GB IE IT LU NL PT
 Based on W09421579
 BR9406236 A 96.01.09 (9610) C07C-017/20
 Based on W09421579
 JP08508028 W 96.08.27 (9702) 14p C07C-019/08
 Based on W09421579
 US5672786 A 97.09.30 (9745) 4p C07C-017/08
 Based on W09421579
 EP-690832 BI 98.05.20 (9824) E 7p C07C-017/20
 R: BE DE ES FR GB IE IT LU NL PT
 Based on W09421579
 DE69410455 E 98.06.25 (9831) C07C-017/20
 Based on EP-690832

CITATIONS
APPLICATION DETAILS

MAIN INT'L CLASS.
SECONDARY INT'L CLASS.
ADD'L INT'L CLASS.
ABSTRACT

Based on W09421579
ES2115940 T3 98.07.01 (9832) C07C-017/20
Based on EP-690832
AU-691486 B 98.05.21 (9832) C07C-017/20

Previous Publ. AU9462133
Based on W09421579
US2744148, US2745886
94WO-GB00497 94.03.14
94ZA-001818 94.03.15
94AU-062133 94.03.14
94AU-062134 94.03.14
94EP-909203 94.03.14 94WO-GB00497 94.03.14
94BR-006236 94.03.14 94WO-GB00497 94.03.14
94JP-520763 94.03.14 94WO-GB00497 94.03.14
94WO-GB00497 94.03.14 95US-507429 95.09.06
94EP-909203 94.03.14 94WO-GB00497 94.03.14
94DE-610455 94.03.14 94EP-909203 94.03.14
94WO-GB00497 94.03.14
94EP-909203 94.03.14
94AU-062133 94.03.14
C07C-000/00 C07C-017/08 C07C-017/20 C07C-019/08
B01J-021/04 B01J-023/06 B01J-023/20 B01J-023/62
B01J-023/70 B01J-027/12
C07B-061/00
W09421579 A

Process for the prodn. of difluoromethane (I) comprises: (a) contacting dichloromethane (II) with hydrogen fluoride (III) in the presence of a fluorination catalyst to produce a product stream (PS) comprising (I), monochloromonofluoromethane (IV) and unreacted starting materials; and (b) sepg. (I) from PS. A sufficient amt. of (III) used in the process such that during step (b) the molar ratio of (III) to (IV) is at least 100:1.

Also claimed is the above process further comprising: (c) recovering (I) and recycling (IV) to step (a).

USE/ADVANTAGE - (I) also known as HFA 32 can be used as a replacement for chlorofluorocarbons, esp. in a blend with other hydrofluoroalkanes (such as HFA 1342 and HFA 125) in refrigeration, air conditioning and other applications. Hydrofluorocarbon do not damage the ozone layer. The prodn. of HCFC 31 (IV) is reduced and the conversion of (IV) to (I) is increased. (Dwg.0/0)